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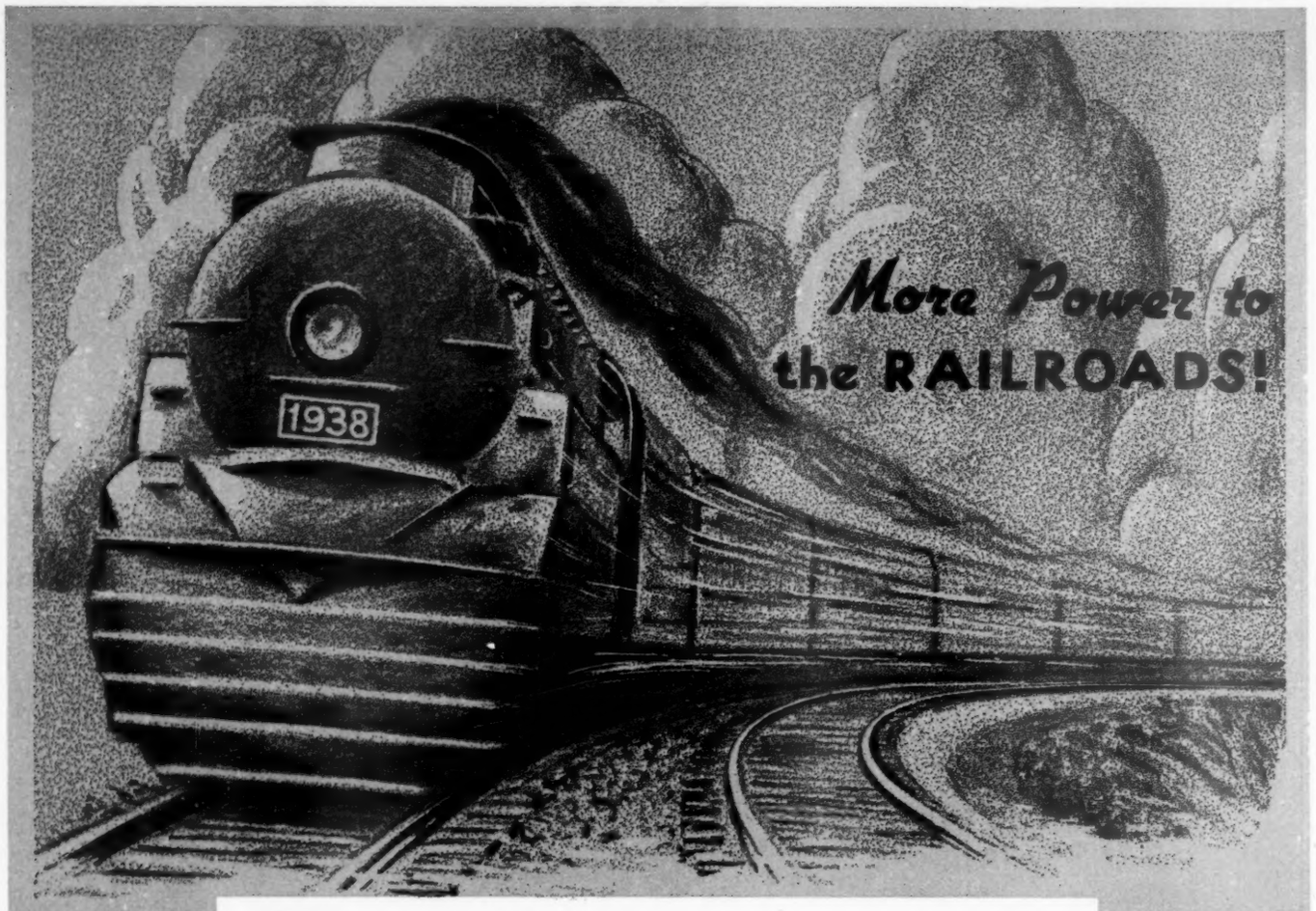

To those who guide the railroads we offer congratulations for their skillful handling of many problems under adverse conditions... May the coming year bring freedom from disheartening limitations so that initiative can have full opportunity for renewal of progressive development... Throughout the scope of our own activity we pledge cooperation.

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RAILWAY AGE

Railways' Past Trend and Present Outlook

President Roosevelt's recent statement in a press conference that he is opposed to government ownership may have been the most important event in the railway history of 1937 or of recent years.

Whether government ownership comes will be determined by whether policies of government, business and labor prevent the railways from being self-supporting under private ownership. There has prevailed for thirty years a tendency to adopt policies more and more narrowing their margin of net operating income. Nobody who is *intelligently* opposed to government ownership can favor continuance of such policies. The President is the unrivaled leader of the radicals and leftist liberals most likely to favor government ownership. There can hardly be, while their leader is opposed to it, an effective political movement for it or for policies that would make it unavoidable.

The President's Friendly Attitude

Among those who have been informed regarding the President's attitude there is no doubt as to the sincerity of his recent statement. It is consistent with his attitude as repeatedly expressed privately ever since he was first nominated for President. It is also consistent with the transportation policies advocated by him publicly in his speech at Salt Lake City in 1932 and subsequently in messages to Congress. However his major policies may have affected general business, and, therefore, the volume of railway traffic, it is a fact that he has throughout the last five and a half years consistently advocated policies tending to make competition between the railways and other carriers less unequal and thereby to maintain private ownership.

The long range trend that has prevailed for thirty years in the affairs of the railways toward destruction of their earning, employing and buying power and, therefore, toward government ownership, has been apparently interrupted at times, but always has been resumed. It led to government operation during the war. It was apparently stopped by the return of the railways to private operation under the Transportation Act. But the "fair return" promises of that Act were never kept. The railways never recovered their pre-war earning power even when business was good; and from 1931 to 1935 they were in danger of general bankruptcy. From about midsummer, 1935, to June, 1937, their prospects seemed improving; but during the last seven months the rapid decline of their traffic and net operating income appeared to make the danger of government ownership greater than ever.

The President's statement, the way it was received and the attitude taken by the public toward the proposed 15 per cent advance in freight rates seem to afford reason for hoping that the people have learned recently a lesson in railroading such as that taught by their war-time experience with government operation. Lincoln said that without public sentiment nothing is possible, while with it everything is possible. When the public shows, under such economic conditions as exist now, a willingness to go down into its pockets for the money to pay a large advance in rates, it should be less difficult for some time than in the past to array it against all policies pushing the railways toward government ownership by unduly restricting their net earnings.

The contents of this "Annual Statistical and Outlook Issue" of *Railway Age* will afford to those who study them striking evidence and illustration of the effects of the changes in earning, employing and buying power that have so long characterized the generally downward trend in railroad affairs.

Twenty Years' Equipment Buying

The need for large increases in equipment buying created by the decline since 1930 in the number of locomotives and cars often has been emphasized in these columns. The railways now have about 12,000 less locomotives, 550,000 less freight cars and 12,000 less passenger cars than seven years ago. Their locomotives have greater average tractive power and their freight cars greater average carrying capacity

than ever; but, nevertheless, there have occurred sharp declines in the *aggregate* tractive power of the former and the *aggregate* carrying capacity of the latter. The reason for these declines is indicated by the statistics in Table I showing the numbers of locomotives, freight cars and passenger cars ordered in 1917-1937, inclusive.

In the first seven years of this period the average number of locomotives ordered annually was 1,756; in the next seven years, 965; in the last seven years, only 201. In the first seven years the average number of freight cars ordered was 85,389; in the second seven years, 83,480; in the last seven years, only 25,450. In the first seven years the average number of passenger cars ordered was 1,150; in the second seven years, 1,875; in the last seven years, only 239.

Locomotives and cars are among the most durable of "durable goods." But they do wear out; and they become obsolete even if not worn out. They have not worn out as fast during the depression years of light traffic as formerly; but, because of unusual improvements in design and materials, they have become obsolete even faster. In consequence, in spite of the greatly reduced number bought, locomotives have been retired from service almost as fast during the last seven years as during the preceding seven, and freight cars even faster. Hence the large reductions in their numbers.

Table I—Equipment Ordered, Years 1917-1937

	Locomotives	Freight Cars	Passenger Cars
1917	2,704	79,367	1,124
1918	2,593	114,113	9
1919	214	22,062	292
1920	1,998	84,207	1,781
1921	239	23,346	246
1922	2,600	180,154	2,382
1923	1,944	94,471	2,214
TOTALS	12,292	597,720	8,048
Averages	1,756	85,389	1,150
1924	1,413	143,728	2,554
1925	1,055	92,816	2,191
1926	1,301	67,029	1,868
1927	734	72,006	1,612
1928	603	51,200	1,930
1929	1,212	111,218	2,303
1930	440	46,360	667
TOTALS	6,758	584,357	13,125
Averages	965	83,480	1,875
1931	176	10,880	11
1932	12	1,968	39
1933	42	1,685	6
1934	183	24,611	388
1935	87	18,699	91
1936	533	67,544	307
1937	369	52,763	829
TOTALS	1,402	178,150	1,671
Averages	201	25,450	239

Twenty Years' Rise and Fall of Railway Investment

The decline in equipment has been relatively greater than in the capacity and condition of other facilities. But, in spite of some notable improvements, there has been retrogression in the capacity and condition of other facilities. Expenditures not only for equipment but for all permanent improvements, as well as for maintenance, have been drastically reduced.

Table II gives statistics showing by five-year periods the changes that occurred between 1916 and 1936 in the total investment in the railroads and in their total net capitalization. From 1916 to 1921 total investment increased almost $3,300,000,000. Throughout this period facilities were inadequate to peak demands; and in the next five years (1921-1926) total investment increased $3,365,500,000. The expansion of traffic was by this time decelerating; and the increase of investment in the five years 1926-1931 was slightly less than two billion dollars. The total increase in fifteen years was $8,600,000,000.

Table II—Railway Investment and Net Capitalization—1916-1936

	Total Investment Class I Railways	Five Year Inc. or Dec.	Net Capitalization All Railways	Five Year Inc. or Dec.
1916..	$17,636,722,230	.....	$16,332,578,328	.....
1921..	20,925,988,630	+$3,289,266,400	17,082,875,993	+$750,297,665
1926..	24,291,466,166	+3,365,477,536	18,234,311,637	+1,151,435,644
1931..	26,242,856,220	+1,951,300,054	18,941,460,134	+707,148,497
1936..	25,805,526,793	−437,329,427	*18,343,300,000	−598,160,134
		(#)8,168,804,563		(#)2,010,721,672

* Estimated on basis of 1935, figure for 1936 not yet being available.
(#) Twenty year increase, 1936 over 1916.

The contrast between what occurred during those years and in the subsequent five years is extremely significant. Between 1931 and 1936, total investment actually declined almost a half billion dollars—the first time in history that the railways made such a retrograde movement. Abandonments so largely exceeded new mileage built that there were about 10,000 less miles of railroad at the end of 1936 than at the end of 1931. There were also, as already shown, thousands fewer locomotives and passenger cars, and hundreds of thousands fewer freight cars. Total investment declined because the amount of property removed from the investment account exceeded the amount put into it.

How Railways Can Contribute to Prosperity

The foregoing statistics regarding the rise and fall of railroad investment indicate the extent to which its great increase contributed to the country's prosperity while it was being made, and also the extent to which its subsequent decline has contributed toward depression. The average annual *increase* in total railway investment during the fifteen years, 1916 to 1931, was $574,000,000. The average annual *decrease* in it during the five years, 1931 to 1936, was $87,500,000. The contribution to depression was an average annual difference of $660,000,000. Furthermore, expenditures for maintenance averaged $1,965,000,000 annually in the fifteen years ending with 1931, and only $1,043,000,000 in the five years ending with 1936—a difference of $922,000,000 annually. The decline in average annual capital and maintenance expendi-

tures combined was $1,600,000,000—a huge contribution to depression to be made by any single industry.

These figures should be sufficient to show the tremendous importance of the change in public sentiment toward the railways that apparently has occurred, and of the change in government policies affecting them that apparently is occurring. An increase in expenditures for *maintenance* of approximately $1,000,000,000 a year is needed if deterioration of railway properties is to stop and they are to be restored to a condition for rendering good and safe service. An increase in *investment* of approximately $750,000,000 a year for some years is necessary if they are to increase their supply of locomotives and cars and improve their other facilities sufficiently to handle satisfactorily the increased volume of traffic they will be offered if and when full recovery of general business occurs.

This total increase of $1,750,000,000 annually in expenditures for equipment, permanent improvements and maintenance would involve a large increase in the railways' own employment, and a much larger increase in employment by the various and ramifying branches of industry from which they would directly and indirectly buy equipment and materials. Thus restoration of railway employing and buying power would not only provide means essential to satisfactory handling of the country's commerce, but would also immediately increase the country's total production, commerce and employment.

Railways and Undistributed Profits Tax

There is but one way to accomplish these results—the adoption by government, business and labor of policies which will substantially increase railway gross earnings without correspondingly increasing operating expenses and taxes, and which will, in consequence, result in a relatively very large increase in net operating income. The *Railway Age* repeatedly has demonstrated statistically, and again demonstrates in this issue, that the amount of railway buying of equipment and materials is determined by the amount of net operating income earned. It is too obvious to require emphasis that increase of investment is directly and solely dependent upon increase of the net operating income from which return upon investment must be paid.

The statistics given in Table II call attention to another point of great importance—the necessity of exempting railways from the federal undistributed earnings tax. They show that in the twenty years ending with 1931 the total investment in the railways increased more than $8,000,000,000. Their net capitalization—i. e., the amount of their securities actually outstanding in the hands of the public—increased only about $2,000,000,000. The necessary conclusion is that $6,000,000,000, or three-fourths, of the increase in their investment was made from *undistributed earnings*. Whatever water there may have been before was made solid ground. Nevertheless, during the depression a large part of them have become bankrupt, and many more have been threatened with bankruptcy.

An Influence for Overcapitalization

If the undistributed earnings tax law had been in effect during the preceding twenty years, and, in spite of it, the railways had made an equally large increase in their investment—which is highly improbable—a much larger part of the money would have been derived from the sale of securities. Their capitalization would have become much larger, and during the depression practically all, instead of only about a third of them, would have become hopelessly bankrupt, inflicting much heavier losses on their security owners than have occurred.

The railroads should be afforded as much opportunity in the future as in the past to invest earnings. There is nothing regarding which human judgment is more fallible than investments. In 1926 the railways earned a return of almost 5 per cent upon their total investment. Their increase in investment during the subsequent ten years was relatively much smaller than before; and yet in the years 1931-1935, inclusive, they earned an average of only 1.74 per cent; in 1936, a year of prosperity in most industries, only 2.59 per cent; and at the end of 1937 they required a large advance in rates to avoid general insolvency.

The undistributed earnings tax law is the strongest influence against investment, and for overcapitalization of whatever investment is made, that ever was introduced into our economic affairs. Every rational argument that can be advanced for policies tending to increase the earning, investing, employing and buying power of the railroads is an equally potent argument for repeal of the undistributed earnings tax law as it applies to them.

Railway Purchases in 1937 Largest Since 1930

In the railroad and the affiliated railway equipment and supply manufacturing industries the year 1937 began full of apparent promise. It would have ended very gloomily in them excepting for the prospective early advance in rates.

Freight loadings increased 14.1 per cent in the first half of the year; but they began to "slip" in June; began actually less in October than in 1936, and ended the year with a gain of only about 6 per cent. Railway net operating income in the first half of the year was $297,400,000—25 per cent larger than in the first half of 1936 and larger than in the first half of any year since 1930. In the second half of the year it was curtailed by decline of traffic and increases of wages and other costs, and was only about $293,000,000—$136,000,000 less than in the second half of 1936, and also less than in the second half of 1935. For the year it was about $590,000,000 — approximately $80,000,000

(Continued on page 40)

Who Can Stop the "Recession"?

Business and employment have slowed down because investment money is on a sit-down strike—How can it be induced to go to work again, thus restoring jobs and putting new life into dying business?

UNDER a system of private enterprise, which we still have to rely upon to supply our food, fuel, clothing and shelter, the amount of business done in the country and the number of jobs to be had depend finally upon the vast multitude of "little fellows" who happen to have a few spare dollars which they are at liberty either (1) to spend, (2) to invest, or (3) to hang onto.

If the "little fellow" believes that there is no business in which he can invest his money where it will be reasonably safe while earning him some interest, then he can either spend it or hang on to it (perhaps in the form of a government bond or in postal savings).

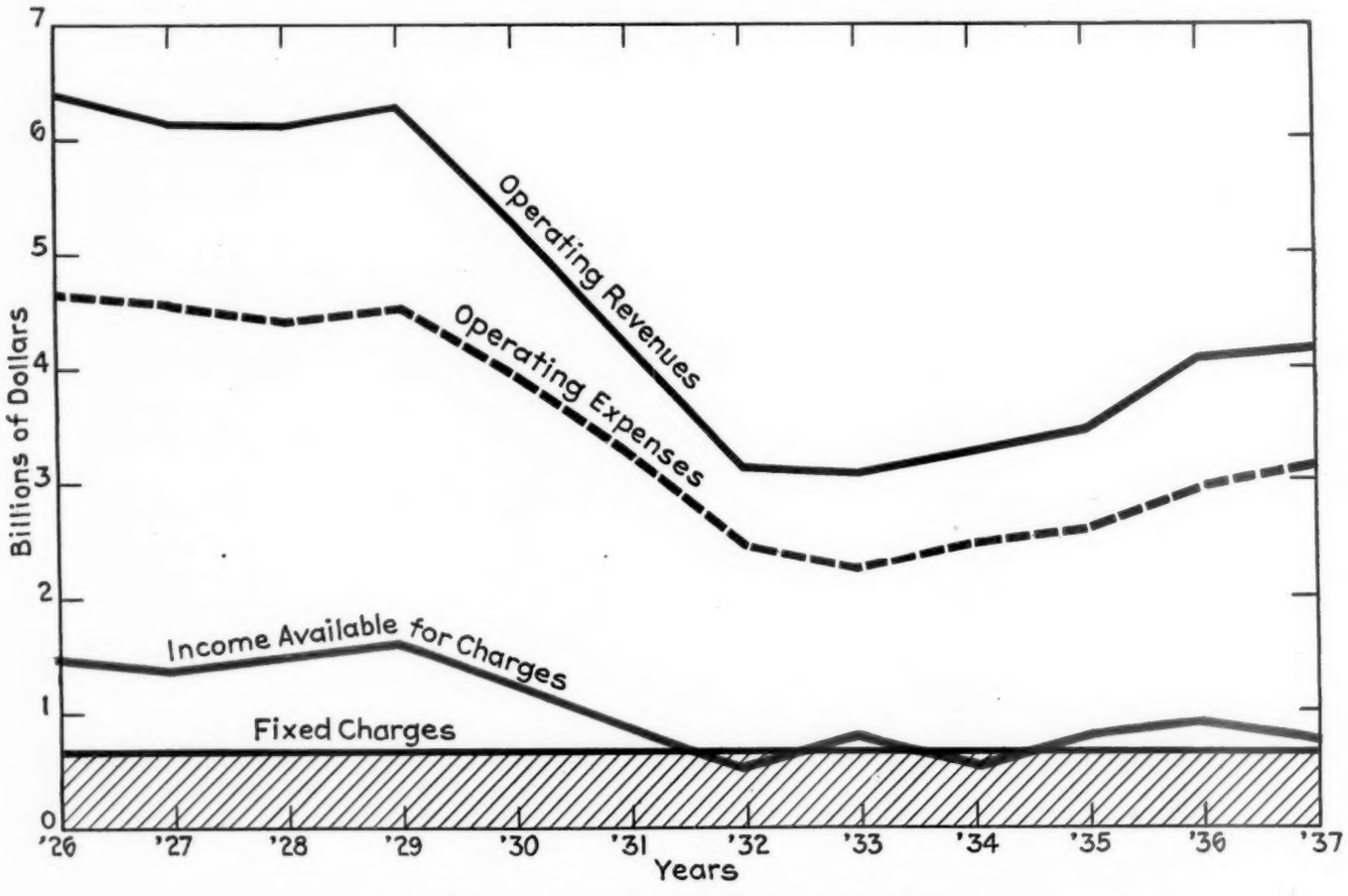
If he spends it, he will help make some business and some jobs—but the influence of such spending quickly dissipates itself. If he puts it in postal savings or in government loans, it helps the government dole out relief and construct public works—the influence as a job-provider of such expenditures also quickly disappearing.

But suppose, instead, that he finds a sound industry in which he can invest his money (or that he entrusts it to a savings bank or life insurance company which invests it in industry for him), what then? Money so invested not only makes jobs for men who build the machines which the industry buys with the investor's money, but these machines go on giving work and making goods and making business until they wear out. In other words:

Inducing the man with a few spare dollars in his pocket to invest them in industry is the surest way there is to provide a permanent increase in employment and business in the country. Indeed, it is the only way to make jobs and business which will last for any length of time.

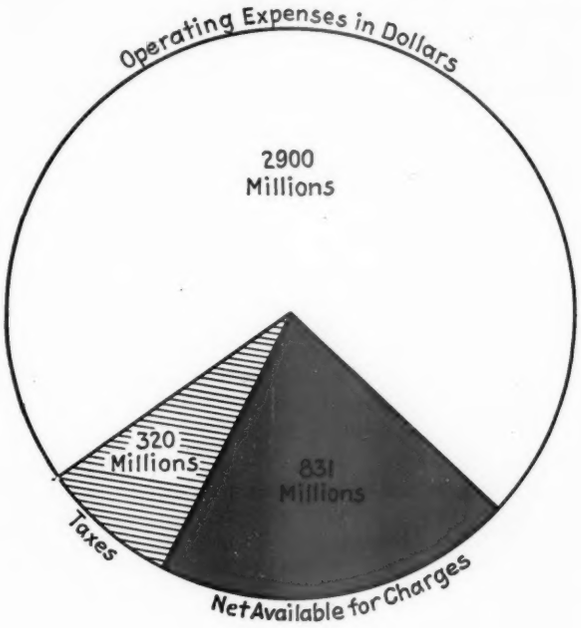
You can't force the man with the spare cash (or the insurance company or savings bank to whom he entrusts it) to invest it against his will. And he will not invest it if he is afraid that he won't get his money back when he needs it, or if he is not paid a sufficiently attractive price for the use of it.

And the railroad industry, of which a large part is not able to pay its debts when they come due (some cannot even pay their present investors the interest promised to them), is not a very attractive place for a new investor to put his spare cash.

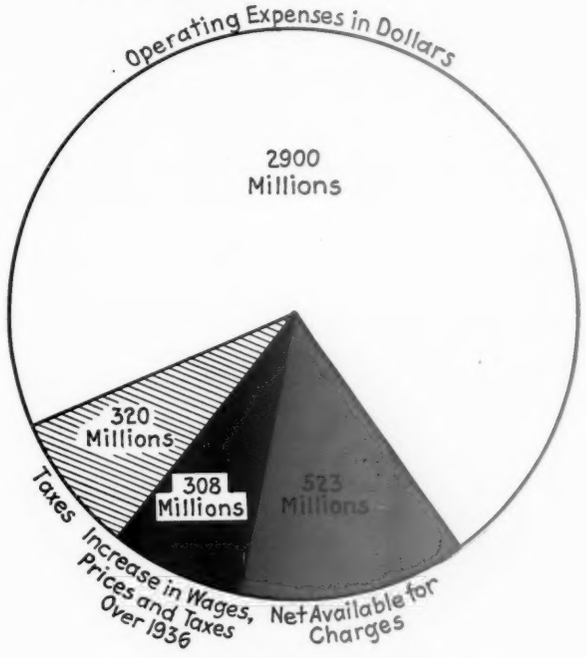


Investment Money Comes in Only When Red Line Moves Up

How Increased Wages, Prices and Taxes Have Reduced the Investor's Share in Railway Revenue



How Railway Revenue Was Divided in 1936



How 1936 Revenue Would Be Divided Today

Thus the way out of the "recession," and toward more jobs and more business, is to induce the investor once more to entrust his money to the railroads. And the only inducement to which he will pay any attention is the inducement of earning power. The railroads, in short, have got to earn more money (i. e., more "net" money—over and above expenses and taxes). How can they do this?

First, let us see by how much they are now falling short of earning enough to attract investors' money. Look at the chart on the opposite page. The top line shows operating revenues (that is, money received from patrons) in each year since 1926. Note how this line took a nose-dive following 1929, and how during the past few years it has been coming slowly up again.

The second line shows operating expenses (wages for railway employees, money spent for fuel and supplies necessary to keep trains running). The cross-hatched portion at the bottom shows "fixed charges" (that is, rents and interest on mortgage bonds). These are debts which have to be paid regularly each year, and if they are not, then the railroads are "broke."

We are looking at railroads here from the viewpoint of the man whose money we want to go to work for the railroads—and to this man it is the red line in this chart that is important—in its relation to the cross-hatched section at the bottom of the chart. This line shows "income avaliable for fixed charges," and out of the money represented by this line all interest and rental debts have to be paid. If there is any money left after interest and rent are paid, that is money which can be paid to stockholders in dividends. The position of this line shows whether the roads are a good place to invest money or an exceedingly poor place.

The red line in 1935, 1936 and 1937 got above the fixed charges a little way—and once more some investments were made in railroads. Furloughed employees began to be called back to work, and railway buying from other businesses began to increase.

Things began to look a little bit rosy—but then something (several somethings, in fact) happened, which now threaten, unless corrected, to push the red line below the fixed charge level once more—reducing railway jobs and railway buying to the low levels of 1932 and 1933. These adverse developments were as follows: Rate reductions on January 1, 1937, wage increases costing 130 millions, increased material prices costing 105 millions, an increase of 73 millions in social security taxes, and the recent decline in traffic.

The above chart shows what present prices and wage rates would do to 1936 earnings. The total "net available for fixed charges" would be only $523,000,000. Now suppose 1938 traffic should be the same as 1936 traffic—it is clear that the railroads would earn $130,000,000 less than they need to pay interest on bonded indebtedness. With such earnings they would be broke—and less able to buy the products of industry than they have been in any year except 1932. Unless the country wants the kind of business we had back in 1932, or worse, then something had better be done to prevent railroad earnings from falling as low as they did then.

The only method available which can restore railroad earnings quickly enough to halt the present recession is that of rate increases—an increase of 15 per cent in freight rates on the average would make necessary an increase of only about 1 per cent in the selling price of commodities, even if all the increase is passed on to consumers. This is a very small concession for the consuming public to make for the benefit which it would derive from restored railroad buying power. Furthermore, a 15 per cent increase in freight rates would place freight rates more nearly in line with prices of commodities, which have advanced 36 per cent since 1932 while freight rates have declined 12 per cent. On the other hand, the increase, on the basis of 1936 traffic, would augment railroad revenues by about $500,000,000—which should raise "income available for fixed charges" well out of the danger zone, and on the way to relative prosperity.

The Railroads' "Siamese Twins"

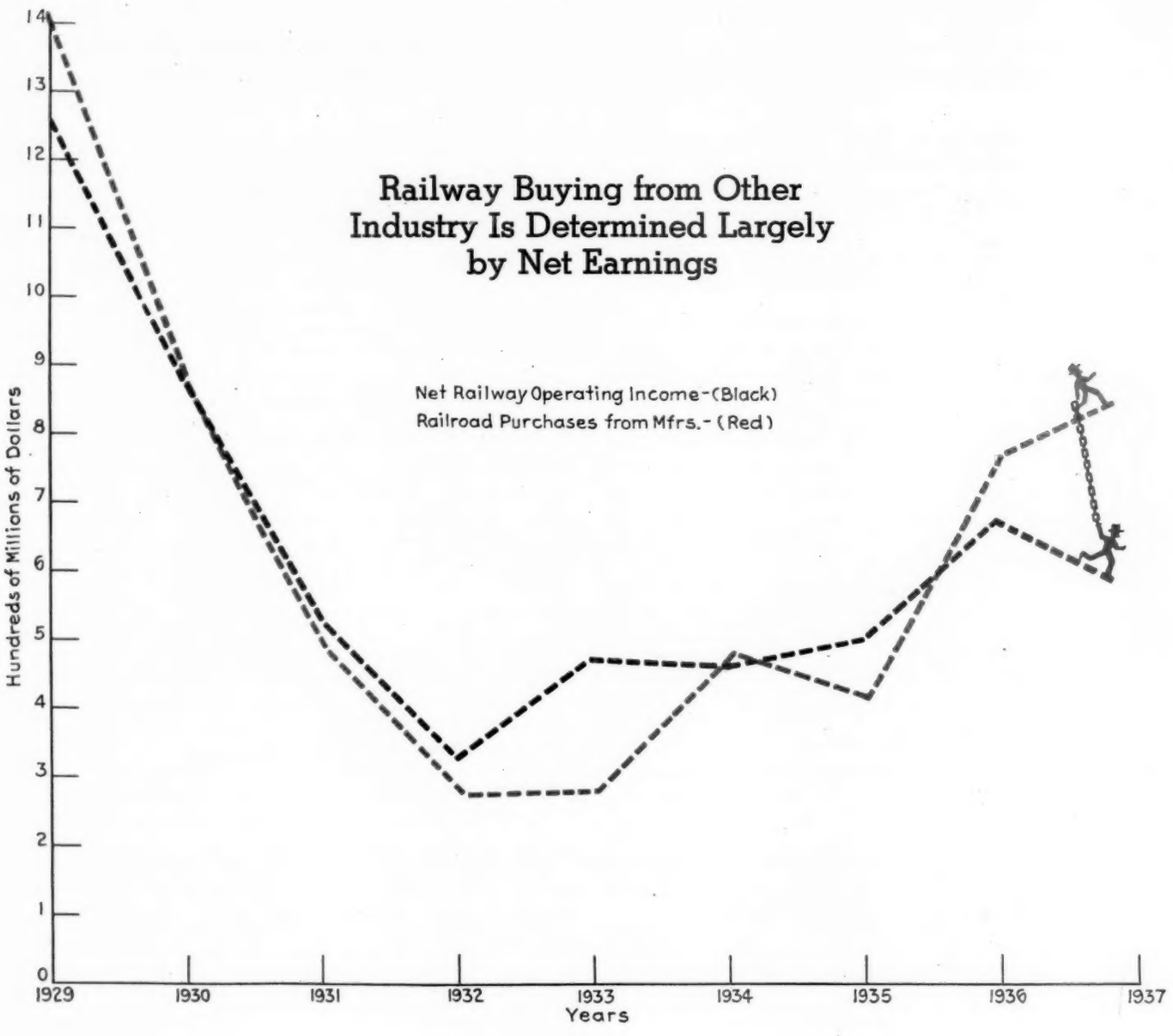
Railway purchases from manufacturers are closely controlled by their net railway operating income—Boost rates $500,000,000 and railway buying will certainly be at least that much greater than it would be without the increase

THE preceding article told why the man who can put a stop to the present recession in business and employment is the "little fellow"—the working man, the farmer, the small business man—with a few dollars saved up which he can invest if he wants to. If industry—and the railroads in particular—can convince him, or the savings banks and insurance companies and investment houses to whom he entrusts his savings, that it has a safe and profitable use for his money, then investment cash will begin to flow in. When it does, industry and railroads will have money to spend for the things they need—and when they spend money in that way, there will be business and jobs for everybody.

The only way to induce the investor to put his money to work making jobs and prosperity is to show him that the industry which seeks his investment is earning at least *some* profit. In the preceding article it was demonstrated that the only quick and certain way of making the railroads show sufficient profit to help the country out of the present recession is to increase their rates.

Repair Work Also Helps Business

But it is not alone by the attraction of new investment money from the outside that the railroads contribute to the nation's prosperity and employment. The railroads



spend money with, and make jobs in, other industry—not only by improvements to their property, but simply by replacing worn-out tools and equipment, the cost of which is charged to operating expenses. Operating expenses for replacement and repair can, however, be postponed, and when they are postponed it means less jobs on the railroads and less jobs in the factories which sell materials and supplies to the railroads.

Why Managements Have to Cut Expenses

No management of any business can afford to allow operating expenses to exceed the revenues received from customers. In addition, no management can afford to neglect to pay taxes; and, if possible, managements also have the duty to pay interest and other debts. If they do not pay their debts, then the creditors will come in and seize the property.

It is the unpleasant duty of management, therefore, when revenues fall off, to curtail and postpone expenses in every way it can. It cannot get investment money to make improvements, because investors are afraid to put up the money. Even if investors were willing to advance it, managements would be afraid to take it and spend it for fear that they would not have funds with which to pay interest. Consequently, expenditures for improvements, with all the jobs and business they would make, go "out the window" when railroad profits fall too low.

Not only expenditures for improvements, but operating expenses also have to be reduced—to give a margin of safety over revenues received from customers to allow for paying taxes and interest on debts. Reducing operating expenses drastically always involves postponing purchases of goods needed to replace things which are wearing out. Curtailing the buying of these things is just as bad for general business and employment as is reduction of spending for improvements. It reduces railway employment, as well as that in outside industry, because railway workers are given jobs in repair and replacement, and when such work slows down there are inevitably fewer jobs available for employees on the railroads.

In the preceding article the importance to the investor of the figure "income available for fixed charges" was shown. The ups and downs of that curve, it will be remembered, indicate the safety or risk involved to the investor in putting his money in the railroads. In the diagram on the opposite page we indicate by the black path the ups and downs of another important figure, "net railway operating income." This term means the money the railroads have left from their purely railroad operations (excluding interest received on securities they own), after the payment of taxes, but before paying rents or interest on bonds. The principal difference between this term and "income available for fixed charges" is that this term does not include interest received from ownership of securities.

Net Operating Income a Barometer

The importance of "net railway operating income" is that it seems to serve as a sort of barometer for all railway purchases from manufacturers—whether for purposes of investment or for repair and replacement. After all, the self-interest of the American public in the railroads (aside from efficient transportation service) is in the total volume of business and employment that railway patronage of industry can provide—and not in the distinction between money spent for repairs and that spent for improvement.

Well, then, net railway operating income is the most important railroad statistic there is for the American public to watch and defend. Because, as the chart on the opposite page plainly shows, net railway operating income is a Siamese twin of the total money spent by the railroads for purchases from manufacturers—which is where the railways touch the nation's pocketbook nerve.

Look at the courses followed by these Siamese twins since 1929. When the black twin has fallen, he has dragged the red one with him. When the black one has gone up, the red one also has risen.

A Measure of Safety

Why this Siamese relationship? Simply because the net railway operating income a railroad earns currently is the measure of the distance which separates it from the sheriff. If it rises, that rise means improved railroad credit and the chance to raise new investment capital on favorable terms—so railway buying from manufacturers goes up. If income rises, the effect on management is that it is no longer necessary to put off spending money for needed repairs and replacements. Necessary renewal parts can be bought and furloughed railway employees must then be called back to apply them.

If, on the other hand, net railway operating income falls sharply, what then? Railroad credit declines, so that it is difficult to secure investment money—and just as difficult to pay the interest on it; so expenditures for improvements have to be curtailed. The profit margin is greatly reduced or disappears altogether, so improvements cannot be financed out of earnings. To avoid losing the property to the roads' creditors, managements are forced to reduce and postpone expenditures to the utmost of their ability. So employees have to be furloughed and purchases from manufacturers inevitably decline. The Siamese twins cannot be separated very far, so long as the railroads have the characteristics of a private business.

"America Must Choose"

The chart shows that, in 1937, the curves of net railway operating income and purchases from manufacturers reached the elastic limit of separation possible between them. If the red line is to continue upward once more, then something has first got to be done to push the black line up. The reason that, in 1937, the lines drew apart so widely is that the decrease in net railway operating income developed so rapidly—more rapidly than expenditures could be curtailed. Purchases from manufacturers in the first half of the year were very heavy, based upon what then appeared to be excellent prospects for a continued rise in net operating income. The railroads want to spend money. Following articles in this issue tell why they want to spend it—and how. The only question is: What hope is there for net operating income sufficient to justify increased expenditures? The answer to that question lies largely in the outcome of the proposed increase in rates.

Well, where does the American public desire that "net railway operating income"—the black twin—shall drag the red twin, "purchases from manufacturers," in 1938? As 1937 drew to a close, the black fellow was pulling down hard on the red one—as the chart clearly shows. If the public will support the increase in freight rates, the course of both twins will inevitably be upward—otherwise, downward. The choice ought not be a difficult one for intelligent and patriotic American citizens to make.

How Railway Buying Affects Mr. John Q. Public

Every man, woman and child in America is on the railroads' payroll — And it is easily within the power of American citizens to cause their pay from this source to rise, if they so desire

Who Gets the Money the Railroads Spend?

Railroading is our 20 per cent industry. At present prices the value of railroad securities are equal to 20 per cent of the total values of all our listed corporation stocks and bonds. The railroads purchase 20 per cent of our bituminous coal and 20 per cent of our fuel oil. They buy 20 per cent of our total output of lumber, and 20 per cent of our iron and steel. Railroad prosperity is an essential component of national prosperity.

Transportation contributes more dollars to national income than agriculture does. For each seven dollars that agriculture adds to our total income transportation contributes eight dollars.

If you think that agricultural prosperity is important for our national well-being, you ought to think that the prosperity of transportation is equally important. Railroad transportation is by far the largest element in total transportation.

By Col. Leonard P. Ayres, Noted Economist, Vice-President, Cleveland Trust Company

PEOPLE can't eat figures. A half billion dollars, more or less, spent by the railroads with other industries for materials, equipment and fuel does not mean anything just as a figure. The individual is, quite properly, not so much concerned with "prosperity" in the abstract as he is with: How will a restoration of railway earning power help *me?*

How, in other words, does railroad buying affect—not an indefinite "prosperity"—but the daily bread of Mr. John Q. Public as an individual? That is a fair question and it deserves a candid answer. Well—suppose Mr. Public lives in a steel town, or up on the iron range. In prosperous years the railroads have bought as much as 7,500,000 tons of steel. In the deep depression year of 1932 they purchased only 1,250,000 tons. The difference between 7,500,000 and 1,250,000 is 6,250,000 tons of steel, and that is enough steel to make a difference in the pocketbooks of practically everybody even remotely connected with the steel trade—not only the industry proper and its employees, but merchants and professional people in steel communities; wholesalers and manufacturers and their employees who sell goods in steel communities; manufacturers and their employees who provide equipment used by the steel industry, including shipping on the Great Lakes; municipal, state and federal employees who gain their livelihood from taxes paid by the steel industry and those whose livelihood depends upon whether that industry is working at near capacity or much less than capacity.

Or take lumber: Prior to 1929 the railroads and private car companies used as much as 5.7 billion board feet of lumber in a single year, *which was almost half as much as the total lumber production in 1932.* Lumber used by railroads declined to only a little over a billion board feet a year at the depth of the depression. The difference between that low volume, and that which would occur if railroad purchasing could be restored to normal, gives the far-flung lumber industry and its employees a keen personal interest in any improvement which can be brought about in railway buying power.

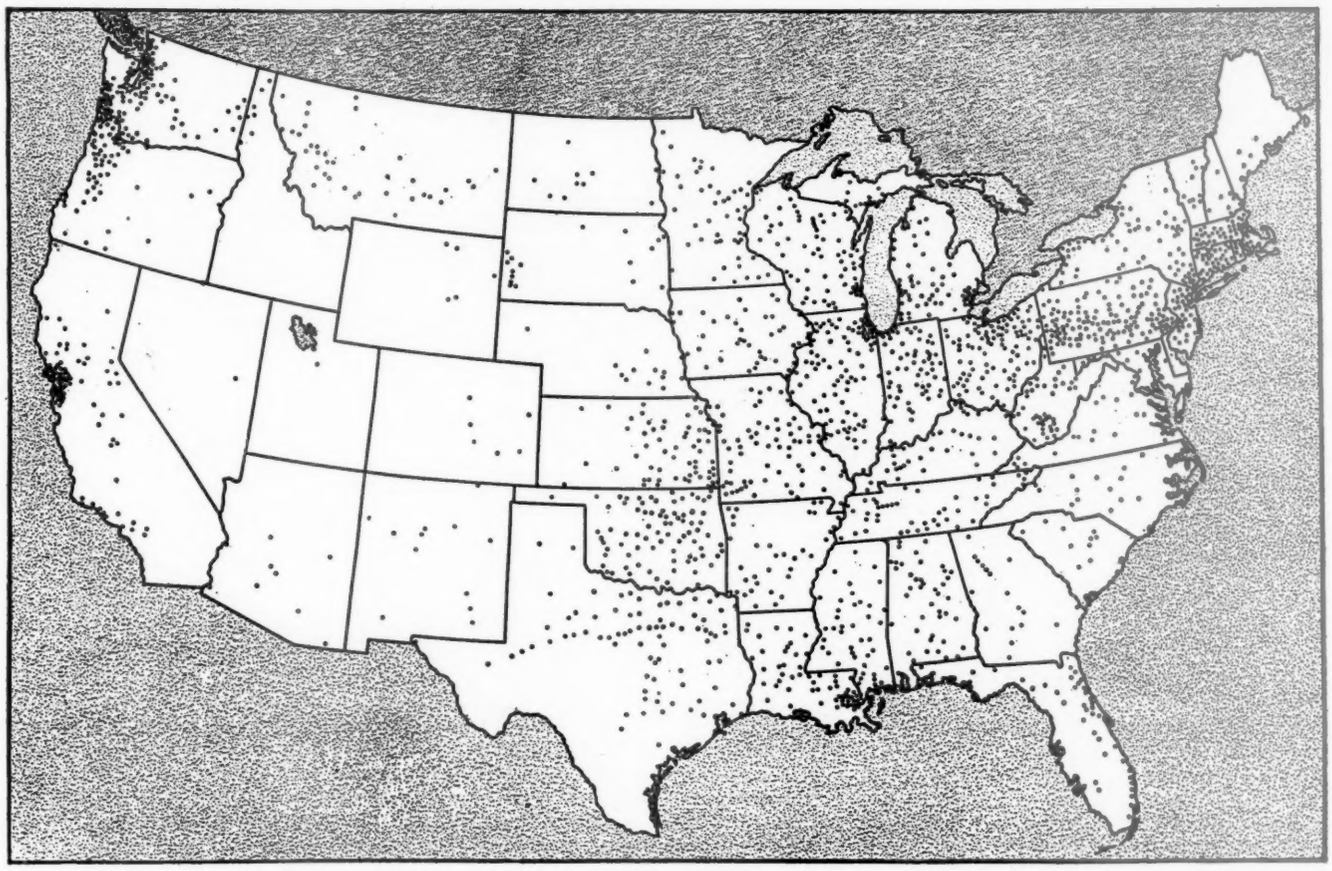
Before the great depression came upon us, railway buying gave employment to 115,000 coal miners, 100,000 iron and steel employees, 75,000 machinery workers, 150,000 lumber workers, 10,000 employees in non-ferrous metals. In all, probably at least 1,000,000 persons (aside from those directly employed by the railroads) were engaged in producing the products which railroads buy. Thousands of families in every state in the union prosper when the railroads have money to spend, or lose their jobs when railroad buying is cut off because they do not have the money to spend. With the catastrophic decline which occurred up to 1932 and 1933, it may be conservatively estimated that fully 750,000 of the 1,000,000 employees who supply materials for the railroads lost their jobs. With the return to somewhat better conditions, by 1936 probably 250,000 of those who lost their jobs because of railroad poverty had regained them.

Contractors, Doctors, Printers . . . .

It is not alone in their purchase of fuel and materials that the railways contribute to employment and prosperity in other business. They are a large customer of construction contractors, of electric and other public utilities, of advertising agencies and publications, of printing firms, of owners of business buildings—and countless other enterprises. When their net earnings improve, they are able to—and actually do—spend money more freely with such firms.

The railroads paid out over 70 million dollars in 1936 for rent of privately owned freight cars, over 39 millions to electric utilities, almost 15 millions for water, 67 millions to construction and other contractors, 7½

Some Communities Which Will Benefit When Railroad Buying Turns Upward



Towns and Cities Shown Above Are Not the Only Centers Which Supply Railway Materials—But They Represent a Survey of Actual Orders Placed by Several Railroads

millions to associations and clubs, over three millions to druggists, hospitals and the medical profession, 11½ millions for advertising, 9½ millions for printing tariffs. There is not a person in the country whose income is not improved in some measure or whose job is not made safer when railroads have money to spend.

Now once more the curve of unemployment in the industries which supply railroad needs is mounting. What do we want from 1938: That it shall point upward to pre-depression employment, or downward to the dark days of 1932 and 1933? There cannot be much doubt of the answer to that question—and yet, unless railway net earnings are quickly improved, the recession in their support for industrial employment cannot be stopped. The proposed increase in rates is the one and only method available by which earnings can be bolstered up at once, turning back the wave of unemployment before it gets beyond control.

Almost a Billion a Year Needed for Improvements

Nine hundred million dollars might well be spent by the railroads for improved plant and equipment in each of the next several years, if their credit is strengthened by adequate earnings, according to testimony presented a few weeks ago before the Interstate Commerce Committee by Ralph Budd, president of the Chicago, Burlington & Quincy, in support of the petition of the railways for increased rates.

These opportunities for effecting economies and improving service through the investment of new money are among the most promising features of the present railroad situation, Mr. Budd said, but added that the first essential of any such investment is that the railways be permitted net earnings sufficiently large to support their credit.

"The railways," Mr. Budd said, "might well replace their 2,000,000 cars in the next two decades through the purchase of 100,000 new cars a year, at an annual expenditure of $300,000,000. They also might advantageously purchase 2,000 new locomotives annually for the next several years, at a yearly cost of another $300,000,000, while a like sum could be spent to good purpose for other physical improvements to the railway plant. Such a program of capital expenditures, however, calls for the restoration and stabilization of railroad credit, which, in turn, can be brought about only by adequate net earnings."

The Railroads Need New Engines

Over 70 per cent of the inventory was built before the recent most intensive period of motive-power development

DURING the past seven years the number of new locomotives purchased by American railroads has been exceptionally low. Retirements, however, were made year after year in about the same volume as had prevailed since 1923. This has had two important effects on the motive-power inventory. First, there has been a marked reduction in the number of locomotives in service and a reduction, though less marked, in their aggregate tractive force. Second, in spite of the continued cleaning out of the inventory at the bottom, the encroachment of old age has moved toward the top.

One of the charts shows clearly the relationship which has existed between the total number of locomotive units for all classes of service and the demand for locomotives as reflected in road locomotive miles. These comparisons are presented on the basis of the situation in the month of the fall peak of each year from 1928 to 1937, inclusive. This chart indicates in a general way the fact that the peak traffic in the fall of 1936 had reached a point in relation to the number of locomotive units closely approximating that of 1928 and 1929—years in which reserve power was pretty completely utilized.

A further study of locomotive performance by classes of service bears out the implication of the more general figures on which the chart is based. This is presented in the table of Freight-Locomotive Performance. Comparing the performance in 1936 with that of 1928 and 1929, it is evident that the active locomotives were more intensively utilized in 1936 than during the earlier periods and that there was only a slight margin of difference between the intensity of utilization of the entire inventory between the two periods. The reserve in 1936 was in the larger number awaiting repairs.

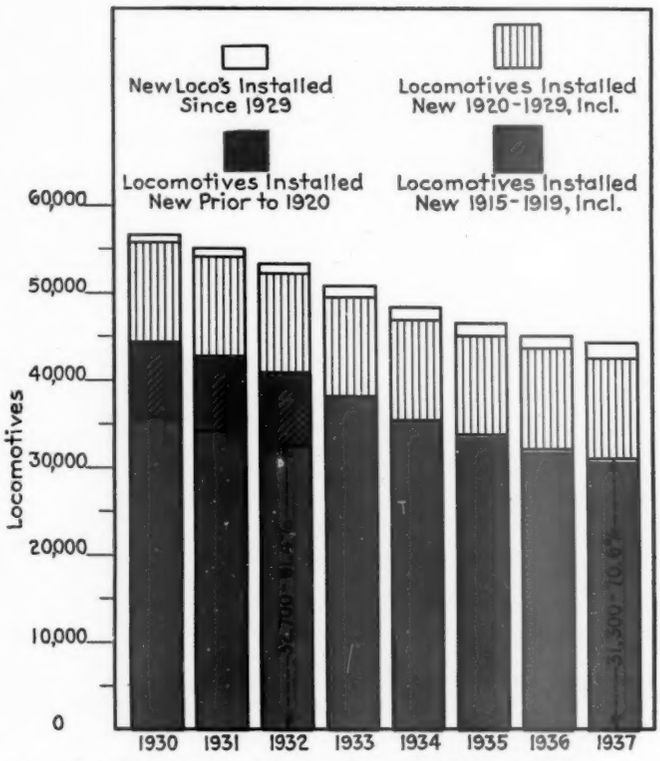
With the increase in the number of locomotives in active service during the fall of 1937, and the intensity of utilization of the preceding year, it is evident that the present freight-locomotive inventory could produce a maximum of some 55.4 million locomotive-miles during a peak month with no greater strain on the supply than was evidenced in the fall of 1936. This is an increase of nine per cent over the 1936 performance, and would require a reduction in the number of locomotives awaiting repairs to 13.5 per cent.

An increase of nine per cent in car loadings from the four weeks' average peak of 1936 would bring the total up to about 895,000 cars. In another article it is estimated that the present freight-car supply is capable of handling an average peak loading during the four highest fall weeks of about 900,000 cars per week. The two figures indicate a close balance between the available reserve of freight-car and freight motive-power capacity.

Age Distribution of Locomotives of the Class 1 Railways During the Past Eight Years

	New locos. installed since 1929*	Locos. installed new 1920-1929 inclusive†	Locos. installed new prior to 1920†	Locos. installed new 1915-1919 inclusive†	Total locos. on line†
1930...	809	11,190	36,063	8,520	56,582
1931...	995	11,190	34,544	8,400	55,149
1932...	1,088	11,190	32,765	8,273	53,316
1933...	1,102	11,190	38,611	....	50,903
1934...	1,193	11,190	35,921	....	48,304
1935...	1,332	11,190	34,068	....	46,590
1936...	1,430	11,190	32,526	....	45,146
1937...	1,905	11,190	31,321	....	44,416

* From I.C.C. Statistics of Railways in the United States, except 1936 and 1937, which are estimated.
† Based on I.C.C. statistics.



Age Distribution of Locomotives, 1930-1937, Inclusive

One of the charts shows the trend in the age of the motive-power inventory during the past eight years. In this chart the locomotives have been classified in three major age groups—those which have been built since the end of 1929; those which were installed during the years 1920 to 1929, inclusive, and those installed prior to 1920. The newest locomotives in the latter group, it may be noted, are those built to the designs of the United States Railroad Administration.

As a sub-division of the locomotives built prior to 1920, those placed in service during the five years, 1915-1919, inclusive, are also shown for 1932 and the earlier years.

It will be seen that in 1932 the locomotives built prior to 1915, which at that time were 18 years of age or older, constituted 61.4 per cent of the inventory and that, in 1937, those built prior to 1920—18 years of age or older—constituted 70.6 per cent of the inventory. The injection of new life into the locomotive inventory has been entirely inadequate to prevent the steady advance of old age toward the top.

In the improvement of the steam locomotive and the development of new types of motive power, the period

since 1920 has been one of the most fruitful in the history of the railroads. During this period marked advances have been made in boiler proportions, including larger fireboxes carried on four-wheel trailing trucks, higher boiler pressures, and higher super-heat temperatures. There have been many improvements in structure or mechanical details, some of which are contributing to improved performance and others to reduced maintenance of modern locomotives. Such details include alloy boiler steels, rolled-steel frames, complete bed castings of which the cylinders form an integral part, tandem main rods, lighter reciprocating parts and better counterbalancing, improved lubrication, roller-bearing journals, and roller-bearing driving rods. All of these items and others have been developed or have attained general acceptance since the best of the bottom 70 per cent of the present motive-power supply were built.

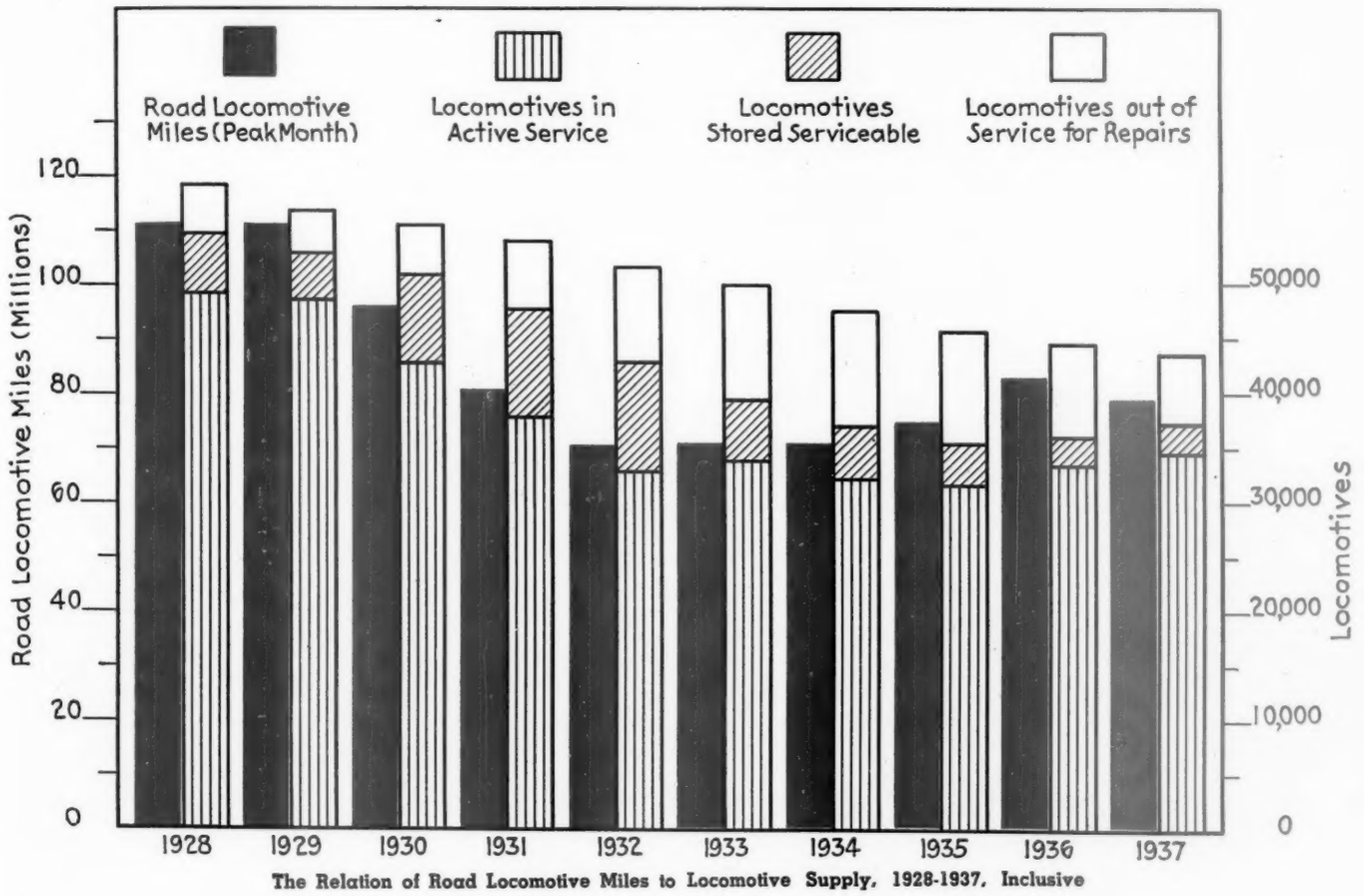
The Diesel-electric locomotive has made a place for itself in switching service. But slightly more than 2 per cent of the total engine-hours in switching freight cars are performed by the new type of motive power and only about 13 per cent of the engine-hours in passenger switching in 1937. The age of the steam switch-engine inventory averages higher than that of the locomotives assigned to the road service. The replacement of obsolete switching locomotives offers opportunities for returns on the investment fully as attractive as those demonstrated in road service.

That there is a steady increase of maintenance cost with locomotive age is becoming a well-established fact. Even where the opportunity for increasing train loads with corresponding reductions in train mileage is not a controlling factor, as may be the case in passenger service, reduction of maintenance and improvement in fuel performnace constitute strong factors in making maintenance of the old power economically indefensible. With the demand for increased speed which is spreading through the passenger service much of the older motive power is becoming mechanically unsuitable for the service. The performance of Diesel-electric motive power in high-speed passenger service is a challenge which has not been neglected by those interested in the development of the steam locomotive, and either the modern steam locomotive, or with the Diesel-electric, has clearly made the older passenger locomotives obsolete for modern service conditions. In the case of freight service the steadily increasing speeds have also done much to end the economical life of the old power.

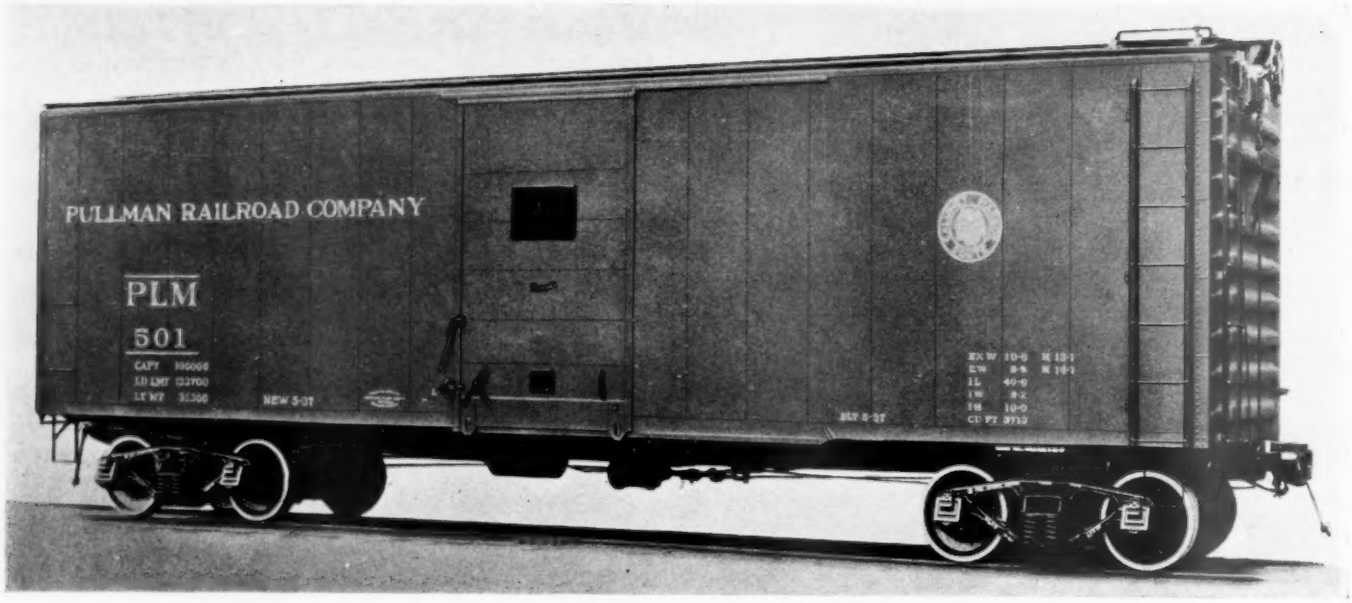
Freight-Locomotive Performance (Month of October)

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
Freight locomotive—miles (000,000)	65.17	64.70	54.67	44.93	40.37	40.59	41.21	44.96	50.74	46.39*
No. freight locomotives on line	31,215	29,955	29,368	28,794	27,806	27,197	26,345	25,226	24,594	24,106
No. freight locomotives awaiting repairs	4,235	4,165	2,667	3,563	5,158	6,296	6,434	6,456	5,336	3,873
No. freight locomotives serviceable	26,980	25,790	26,701	24,909	22,648	20,901	19,911	18,770	19,258	20,233
No. freight locomotives stored serviceable	3,160	2,601	4,740	5,934	6,066	3,354	3,180	2,420	1,567	1,892
No. freight locomotives in service	23,820	23,189	21,961	18,975	16,582	17,547	16,731	16,350	17,691	18,341
Average miles per month, all locomotives	2,085	2,160	1,860	1,560	1,450	1,490	1,565	1,780	2,060	1,925
Average miles per month, active locomotives	2,735	2,790	2,490	2,365	2,435	2,310	2,460	2,750	2,870	2,525

* September.



The Relation of Road Locomotive Miles to Locomotive Supply, 1928-1937, Inclusive



Welded Box Car of Low-Alloy-Steel Construction Weighing about Five Tons Less than the Best Comparable Design Using Conventional Materials and Construction Methods

Freight-Car Demand Accelerated by Two Factors

Reserve inadequate to meet probable traffic increase—Improved materials and construction technique make old cars obsolete

UNLESS there is an increase in the supply of freight cars a troublesome car shortage awaits the first substantial upturn in traffic above that represented by the fall peak in 1936. Scattering shortages developed which began at the end of September, 1936, continued throughout the remainder of the year and until the end of July, 1937. These are the first shortages to be recorded since 1929, and are the best of evidence of the inadequacy of the supply available at that time to meet any substantial increase in demand.

The last preceding years in which there was an intensity of freight-car utilization similar to that developed in the fall of 1936 were 1928 and 1929. During those years, with a total supply of freight cars (cars on line) of about two and one quarter million, peak weekly loadings (the average of the four highest consecutive weeks), approached 1,200,000 cars. Surpluses during the two peak periods were 86,000 and 107,000 cars, respectively, and cars awaiting repairs amounted to 148,000 and 133,000, respectively, or 6.6 per cent and 6 per cent of the total cars on line for the two periods, respectively. During the 1928 peak the cars on line per car loaded weekly was 1.89 and the number of active cars per car loaded weekly was 1.69. There was no substantial change from these ratios in 1929.

The chart shows the trend of car loadings during the fall peaks throughout the succeeding years. It indicates a relatively small change in the ratio of utilization of cars actually in use. In 1936 when weekly loadings during the four peak weeks averaged 820,000, the total car supply had declined to 1,743,000 and the total number of active cars was 1,389,000. The ratio of active cars per car loaded weekly had come down to practically that of 1928. Because of the much larger number of cars out of service awaiting repairs, however, the total cars per car loaded weekly stood well above two.

The persistence of scattering shortages during this period and the succeeding weeks of 1936 indicate clearly that a ratio of much less than 1.7 cars in active service per car loaded during the fall traffic peak is not likely to be successfully attained. Warning signs of imminent overload began to appear when the car surplus dropped below 130,000.

The decline in the number of cars on line which has been steadily taking place since 1930 was considerably reduced but not completely checked during 1937. There was also a slight inrease in the peak loadings as measured by the average of the four highest consecutive weeks. Owing to an increase in the active cars as the result of reductions in the number of cars awaiting repair and in the number of stored cars, there was no change in the ratio of active cars to cars loaded weekly. Had traffic during this period held up to that promised by the earlier months of the year there would undoubtedly have been a still further reduction in the number of bad-order cars. By a reduction of bad orders to 103,000, or about 6 per cent of the total number on line, and no change in the number of surplus cars, about 85,000 cars could have been added to the supply of active cars.

At the best previous utilization ratio of 1.67 active cars per car loaded weekly, which was attained in 1929, 1,500,000 cars would protect an average weekly peak loading of about 900,000 per week, but not without the probability of scattering car shortages.

The present freight-car inventory, therefore, offers a very narrow margin of reserve to meet the increase in traffic which may reasonably be expected with a resumption of business progress.

Unlike the locomotive, which consumes both material and labor in producing power for the movement of trains, the freight car consumes material and labor only for its upkeep. The cost of maintenance, therefore, has always been the primary operating factor to be considered in determining the relative economic value of the old or the new car. For many years the absence of design developments of a character affecting appreciably the obsolescence of freight cars has weighed heavily in favor of the perpetuation of existing cars by heavy repairs and rebuilding.

One of the major developments of the past few years affecting the obsolescence of the physical facilities of the railroad is the development of the new structural materials which are particularly applicable in freight-car construction and the growing adaptation of autogenous welding as a substitute for riveting in fabrication.

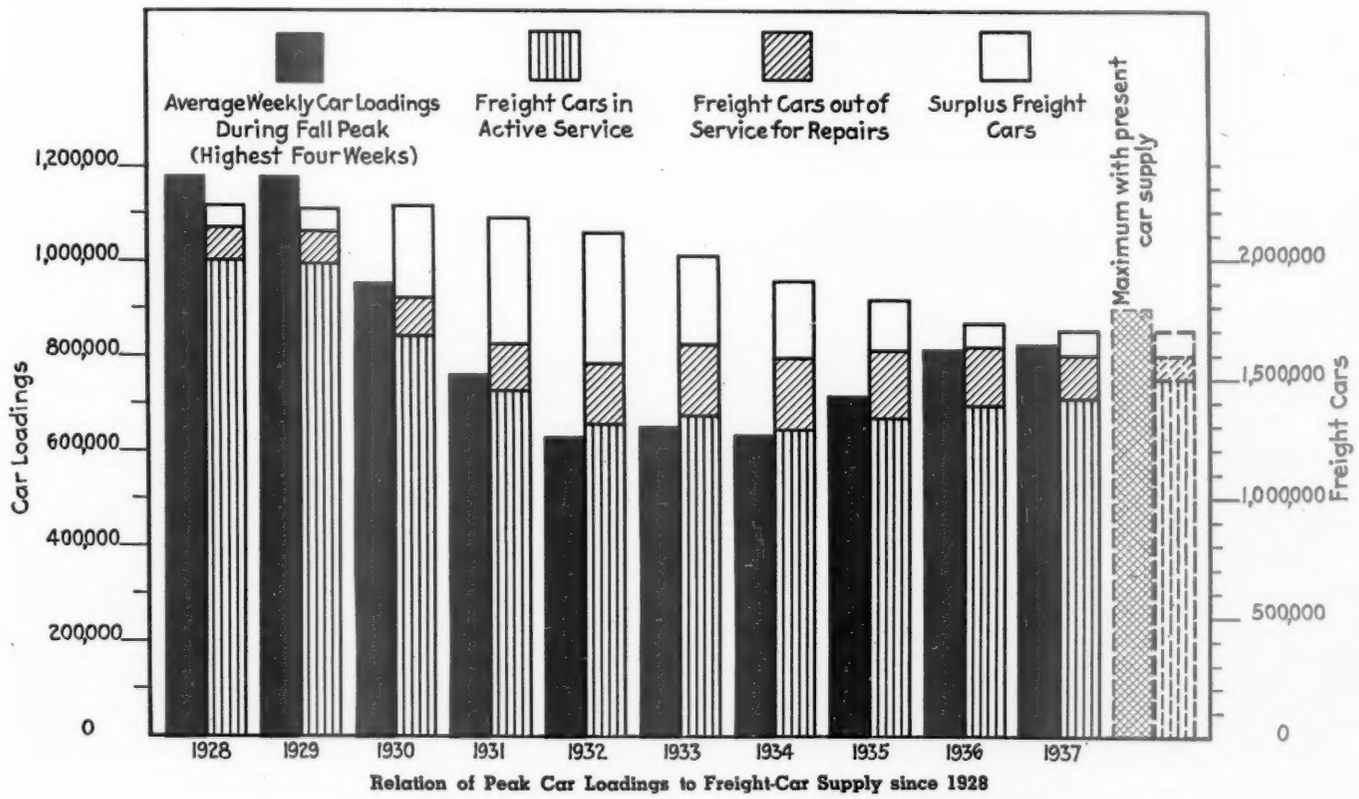
By the employment of both of these factors, and by using higher strength steel castings, it has now been demonstrated that cars of light capacity can be produced which will have tare weights reduced by as much as five tons, or 23½ per cent in the case of box cars, and with pay-load to gross-load ratios upwards of 80 per cent in the case of open-top cars. The ability to produce such cars, at the best, for no more than the cost of the best designs available for carbon steel fabricated by riveting or, at the worst, for no more per ton of carrying capacity than conventional designs, is a powerful factor in accelerating the growth of obsolescence of existing cars.

With an increase in buying power there are two strong factors tending to bring the railroads into the market for new freight cars more extensively than they have in the past ten years. First is the threat of a shortage which has been hanging over them since the fall of 1936, the effect of which was definitely felt in the orders placed during the later months of that year and early in 1937. Second is the new materials and construction methods which have exercised the most powerful influence in accelerating obsolescence of any development which has taken place since steel replaced wood as the major material of car construction.

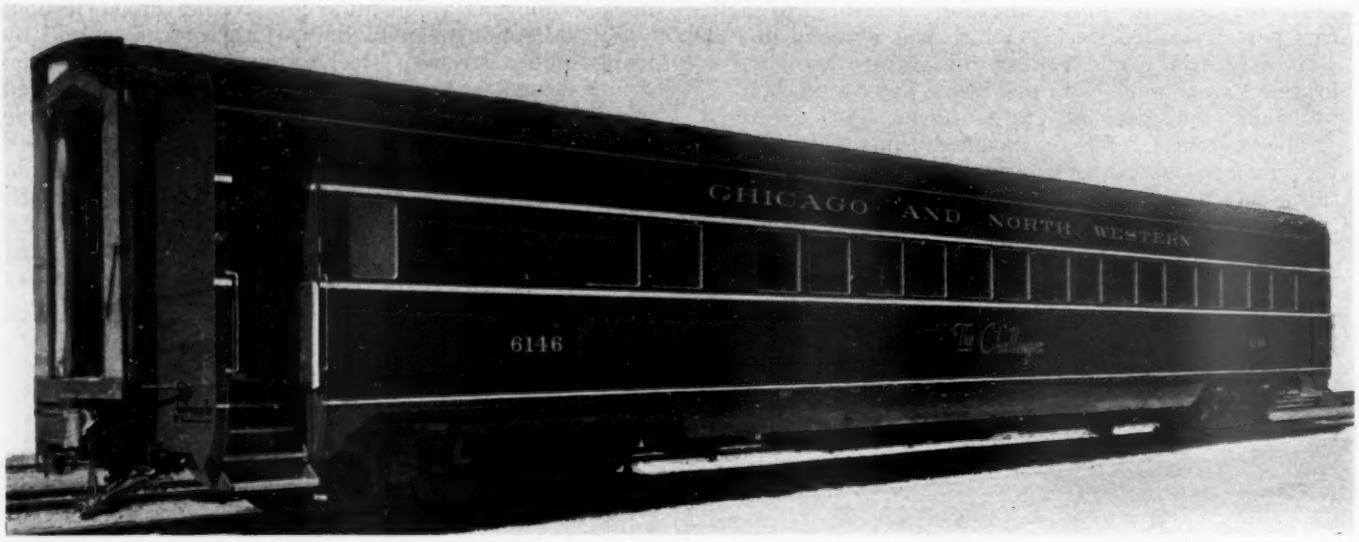
Trends in Freight-Car Supply and Freight-Car Utilization

	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	Probable maximum utilization
Peak loading (000)*	1,184	1,186	960	768	635	658	641	721	820	832	900
Cars on line (Oct. 1) (000)	2,238	2,223	2,226	2,178	2,118	2,019	1,908	1,834	1,743	1,705	1,705
Surpluses (minimum)	86,000	107,000	389,000	532,000	545,000	377,000	318,000	208,000	112,000	102,000	102,000
Awaiting repairs (Oct. 1)	148,000	133,000	157,000	194,000	262,000	295,000	296,000	284,000	242,000	188,000	103,000
Active cars (000)	2,004	1,983	1,680	1,452	1,311	1,347	1,294	1,342	1,389	1,415	1,500
Cars on line per weekly carload	1.89	1.88	2.32	2.84	3.34	3.07	2.98	2.55	2.13	2.05	1.90
Active cars per weekly carload	1.69	1.67	1.75	1.89	2.06	2.05	2.02	1.86	1.70	1.70	1.67
Car shortages	Sept. 23-Oct. 22†	Sept. 23-Oct. 31†	None	None	None	None	None	None	Sept. 30-Dec. 30	Jan. 1-July 31	....
Maximum shortages reported	454	626	....	....	....	....	....	....	836	3,035	....

* Average of four highest consecutive weeks.
† Small shortages, each aggregating fewer than 100 cars, were reported during a number of weeks earlier in the year.



Relation of Peak Car Loadings to Freight-Car Supply since 1928

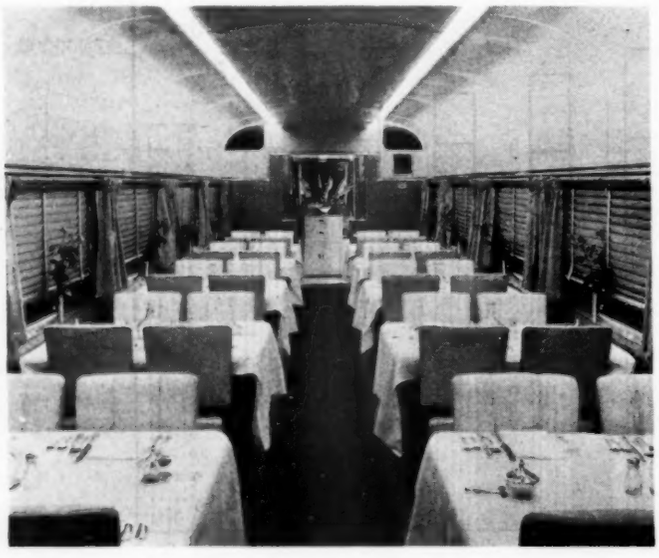


A Modern Lightweight Coach

Passenger Service in a New Era

Catering to a style-conscious public requires complete refitting or replacing of passenger-carrying cars

IN determining the probable future course of the railroads with respect to the ownership of passenger-train cars, the question of the adequacy of the present supply, in point of passenger-carrying capacity, is of purely academic interest. The railroads are coming rapidly to look upon their passenger facilities not in the light of capacity to meet present or immediately probable passenger traffic, but to evaluate it in the light of its merchandising value. The merchandising of passenger service has proved to be a potent influence in attracting favorable public attention to the railway transportation industry as a whole as well as in increasing revenues from the passenger service.



Simple Details Produce Beautiful Interiors

Present Equipment Largely Obsolete

The supply of passenger carrying rolling stock in its present state is very largely obsolete with respect to both of these objectives. Since the introduction of air-conditioning into passenger cars in 1930 a complete revolution has taken place, not only in the materials of construction and ideas with respect to weight in its relation to strength in passenger-car design, but also in the comfort of interior facilities and attractiveness of architectural and decorative treatment. Style factors, both interior and exterior, are beginning to receive and must continue to receive the serious attention of railway managements in attempting to attract patronage because the American people are becoming more and more style conscious and more and more fastidious with respect to personal surroundings.

What are the features of modern equipment which differentiate it from the conventional equipment constituting the greater part of the present supply of passenger-rolling stock?

No small factor in the renewed attractiveness of railway travel and the return of a widespread public interest in the railroads is the development of high-speed passenger-train service. To keep the power demands of high speeds within economical limits light weight is essential and during the past three years there has been an intensive development in the application of aluminum alloys, stainless steel and low-alloy, high-tensile steels to passenger-car construction. The light weight has been accompanied by streamlining which, if not of controlling

importance, aerodynamically speaking, has been one of the potent style factors in attracting favorable public attention. Draft gear and coupler improvements, as well as articulation, have improved riding qualities, as have also refinements in truck design.

On the interior of the cars air conditioning has made possible an entirely new conception of comfort, cleanliness and interior attractiveness. The change from suction to pressure ventilation introduced with air conditioning has removed the barriers which dirt imposed upon a free choice of color tones and the softening of interiors by the hanging of drapes. The design of interior architectural features and decorative treatment, formerly a function of the engineer, who selected his colors for their ability to make dirt as nearly invisible as possible, has passed to the trained artist with results in public reaction which were immediately favorable.

Improved lighting has played an important part both as a comfort factor and as a decorative feature. In the new and refitted coaches alike new ideas with respect to light distribution and light intensity are being carried out. Comfort in coach seats has greatly benefited from the development of the rotating type of reversing mechanism which eliminates the compromise with comfort required in the walkover type, and rubber cushioning has contributed its share.

The railroads have not been slow to avail themselves of all of these factors. The first air-conditioned cars were placed in regular service during 1929 and 1930. There are now in service approximately 11,000 air-conditioned cars, railroad and Pullman owned, representing an investment in this one important feature alone of upwards of $60,000,000, most of it contracted during the lean years of the depression.

The first lightweight streamline high-speed trains were placed in service in 1934. Today 45 trains especially fitted for operation as train units are in service on 14 railroads. Most of these trains, although not all, are of light weight, in the construction of which various new materials have been employed.

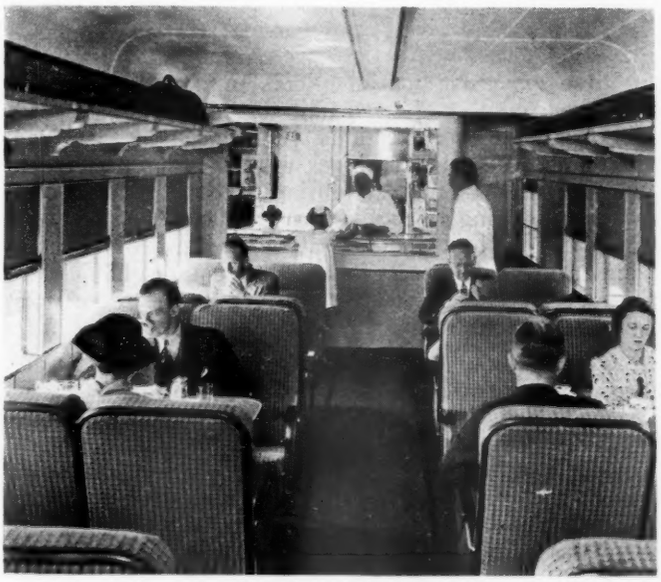
With favorable revenue and credit conditions the re-equipping of other trains with new cars of modern construction and interior treatment will move forward rapidly. Examples of this kind already completed or under way are the 52 coaches, diners, club-lounge and club-baggage cars of stainless-steel construction recently delivered to the Santa Fe by the Edward G. Budd Manufacturing Company and the new equipment for the Challenger trains built by the Pullman-Standard Car Manufacturing Company for the Union Pacific, Chicago & North Western and Southern Pacific.

Variety of Arrangement Is a Factor in the Attractiveness of This Club Car

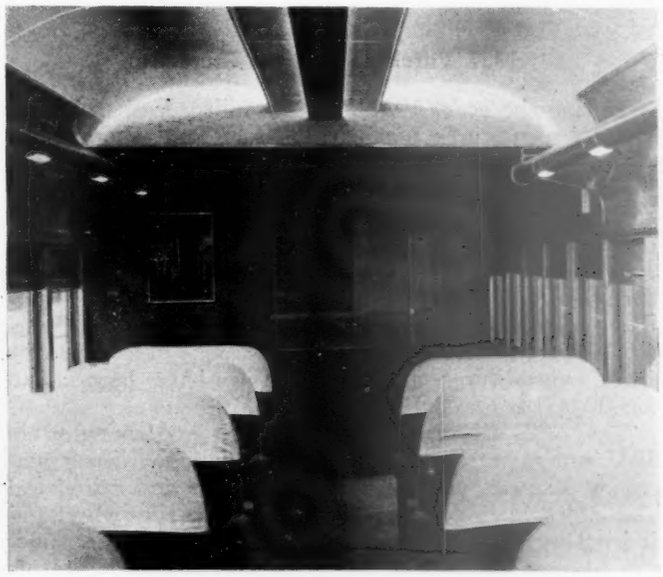
No Stopping Place Short of Complete Modernization

Other programs of rehabilitation of existing passenger cars involve expenditures of $2,000 to $5,000 per car for refitting, relighting and redecorating, exclusive of air conditioning. More such programs await only a favorable opportunity for financing.

The public reaction to the modern passenger-train facilities has been so unmistakably favorable that there is no place for the railroads to stop short of the goal of complete modernization.



Meals Are Served in Coaches



Freedom from Conventionality Characterizes This Coach Interior

New Machine Tools Greatest Need in Shop Equipment

High speeds and long runs demanding greater accuracy of machining—Large number of obsolete machines unable to meet this demand

IN handling a volume of traffic during the past year which, at its peak, approached 900,000 cars a week the railroads of this country found that the shop facilities utilized for the maintenance of cars and locomotives will have to be modernized by the replacement of many units of obsolete equipment if the costs of maintenance are to be properly controlled. The railroads are now in the position of being caught in the narrowing gap between revenues limited by inadequate rates and rising costs due to increases in wages and cost of materials. If there ever was a time when the industry needed to take advantage of the economies of modern equipment and methods it is now.

1937 Purchases Show Increase

During the years 1931-1935 the railroads sharply curtailed expenditures for machine tools and shop equipment. They were forced to do this by existing conditions in spite of the fact that it was then recognized that economies could be effected by the installation of up-to-date facilities. In 1936 when earnings showed signs of substantial increases the roads again entered the market for shop equipment. In 1937, with earnings above 1936, they increased purchases about 50 per cent over the total for 1936 and exceeded the total of 1930. In amount, the 1937 expenditures are estimated to have been about $5,000,000.

The types of machine tools which predominated in 1937 orders were engine and turret lathes, drilling machines, shapers, vertical boring machines and cylindrical and internal grinders. The number of driving wheel and journal turning lathes and quartering machines purchased was only slightly less than in 1929. However, many roads during 1937 have postponed the purchase of these expensive machine tools until after purchases of a larger number of lower unit-cost tools had been made out of limited appropriations. The fact that a substantial number of these machines were purchased is a definite indication of the recognition of the absolute necessity of improving wheel machining practices—a necessity brought about by higher operating speeds. Another outstanding fact of interest in the shop equipment field for this year is that the roads purchased almost three times as many electric welding sets as they did in 1929.

New Shop Equipment Needed

As a result of small-scale buying over a period of several years, conditions in many shops have reached a point where a substantial part of the shop equipment can definitely be classed as obsolete and is unable to perform the task of producing its expected share of work in relation to the amount of labor expended in its use. Where a large part of the shop equipment inventory is made up

of inefficient units, it becomes increasingly difficult to maintain motive power and cars in condition for service at a cost within limits that a road should pay.

Under any given conditions of traffic and operation a railroad finds it possible to pay for so many hours of labor in relation to earnings. Inasmuch as the restoration of locomotive miles to active service through the medium of repair work is in direct relation to the hours worked and the adequacy of the repair facilities efficiently to perform repair work, it is not difficult to see why obsolete shop equipment may make it virtually impossible to repair enough locomotives to meet the demands of service within the limits of the total labor hours which earnings will pay for. In addition to the speed with which work may be performed the quality of workmanship has a decided influence on the amount of service that can be obtained from motive power once it has left the shop.

The primary need in railroad shop equipment today is that of the replacement of a substantial proportion of the machine tool inventory which, because of obsolescence due to age, is no longer able to meet the demand for volume production or accuracy of finish. The full significance of the actual cost of operating obsolete equipment is rarely realized by the man who is forced to get along with what he has in the shop, because he is always hard pressed by the necessity of having to get out work and has little opportunity to study the potentialities of new tools. The executive who authorizes expenditures, as a rule, considers only those proposals that are brought to his attention and approves those offering the greatest return on the investment or those most urgently needed to meet the requirements of service.

A Simple Problem—A Striking Answer

It has been pointed out many times that to continue an obsolete machine tool in service is an expensive luxury. Over 70 per cent of the machines in the average railroad shop are over 20 years old. When one considers the advances which have been made in the last 10 years alone in the art of metal cutting, most anyone will concede that a 20-year-old machine is certainly to be classed as obsolete. It is not necessary to indulge in any complicated mathematical calculations in order to appraise the cost of using obsolete machine tools.

Let's take some actual figures in order to build an hypothetical case, apply some conservative estimates and compare the result with authentic service data. The result is sure to be surprising. In a certain locomotive repair shop there are 220 machine tool units in the machine department. Of these 67 per cent, or 150 machines, are over 20 years old. Assuming that the 150 machines comprising the group over 20 years of age are used 40 hours a week each, the wages paid to the machinists operating them amounts to over $250,000 in a year. This total, incidentally, is $15,000 greater than before the recent increase in wages to shopmen. When the recent wage increase was granted it was necessary to curtail the hours worked by repair shops and consequently curtail the restoration of locomotive miles to road service. Experience indicates that the expense of machine shop labor on these 150 obsolete machines could be reduced at least $65,000 a year by replacing them with modern units at an estimated capital outlay of from $475,000 to $500,000. This estimate of saving does not include reductions in the cost of machine tool maintenance, reduced electric power consumption or economies resulting from a higher grade of workmanship.

In order that the reader shall not be inclined to consider the above hypothetical case too much in the light of guesswork, a glance at facts may be worthwhile. A study recently made of 90 representative locomotive machining operations now being performed on machines over 20 years of age indicated that the time required could be reduced by an average of 42 per cent if the work were to be done on modern machines with modern tooling equipment. In the light of this figure, the estimate of $65,000 seems conservative enough.

Numerous installations made in the past three years indicate that one modern machine has enough greater productive capacity that it can take the place of from 1.35 to 2.50 machines of the 20- to 30-year-old type. By applying the minimum figure alone to the hypothetical shop, one arrives at the conclusion that 150 old machines could be replaced by 112 new ones. At 40 hours a week the labor cost of operating the 38 displaced machines amounts to over $65,000 a year, not to mention the saving of from $8,000 to $11,000 annually in repair costs due to their advanced age, and an additional estimated saving of about $3,700 a year in electric power.

Can Modern Tools Save Money?

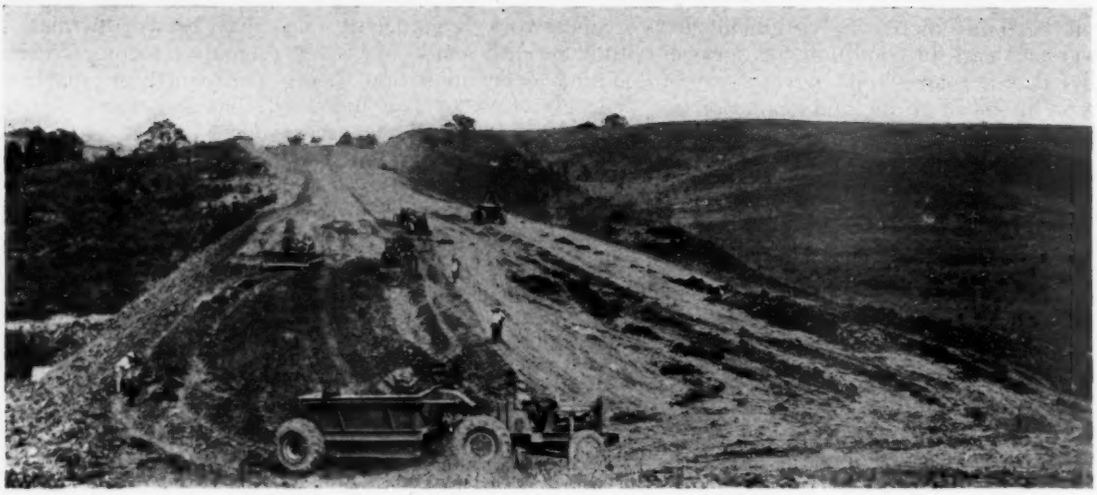
Typical of the results which have been obtained as a result of machinery replacement programs is that of an eastern railroad which in 1935, planned a program for the retirement of 50 obsolete tools having an average age of 33 years and replacing them with 37 modern tools at a cost of $227,000. It was estimated that, by operating the new machines 16 hours a day, 26 days a month, a saving of 26 per cent on the investment could be obtained. This would amount to $59,020 a year or $4,918 a month. The program was approved and the 37 machines were purchased and placed in operation by March, 1936. Due to business conditions the first full year's operation resulted in using this new equipment only 43 per cent of the planned full-time operation. In spite of this, the savings effected at the end of 20 months' operation amounted to $86,478 or a total of 38 per cent on the investment. The monthly average was $4,324.

Another road recently retired 13 old machines in one group and replaced them with 5 new machines at a saving of 65 per cent in the cost of the parts produced in that department.

There are any number of cases where individual units of new shop equipment have paid for themselves in from one to two and one-half years but any lengthy presentation of such cases would add but little to the well-known fact that (1) new shop equipment is badly needed by the railroads; (2) that there should be little excuse for not buying it when it has demonstrated its ability to pay for itself, and (3) if the roads do not make plans to modernize facilities in the face of increasing costs they will inevitably find themselves in a position of being forced to choose between higher repair costs or deferred maintenance.

Increased Earnings Assure Modernization

The buying of 1937 indicated the willingness of the roads to modernize their shops when earnings are sufficient to provide the funds. An increase in rates and better general business conditions should go a long way toward making it possible to continue modernization programs. In any event, those responsible for equipment maintenance policies should not lose sight of the fact that the excess cost of operating obsolete facilities is usually sufficient to pay for their replacement. To continue to operate them is to ignore the necessity for economy.



Little Work of This Type Has Been Done For a Number of Years

Railway Construction— A Pressing Need

FOR almost a decade no new construction has been undertaken by the railways for the purpose of expanding their plant or replacing obsolete facilities. During this time, operating methods have changed more radically than in any equal period of railway history. Furthermore, developments in industry and new methods of distribution have been and still are bringing new problems in railway operation with a rapidity that is bewildering.

Railways, like institutions, cannot stand still; they must either go forward or retrograde. Railway construction is so closely linked with railway operation that suspension of construction activities places a handicap on operation that either reduces its effectiveness and retards the movement of traffic or unduly increases the cost of moving it. Likewise, suspension of these activities prevents the development of new methods designed to expedite this movement or to decrease operating costs.

It was not by accident that railway construction in 1936 was the smallest of record, despite the fact that construction activities, other than new lines, reached a major peak in 1930. Subsequent to 1930, however, as earnings shrank, new projects were not started to offset those that were completed year by year, with the result that both the number of new projects and the sums spent for new and revised facilities fell off rapidly. At the beginning of 1937, prospects for permanent improvement in earnings appeared brighter and a few of the most needed facilities were authorized, although considerable caution was still evident, especially in appropriations for large projects, and many others, although badly needed, were deferred until it could be determined whether this improvement in earnings was really permanent.

Included among the changes that have been mentioned are new forms of competition in transportation which intrude themselves into almost every consideration of railway traffic and operation. In addition, the general public is demanding higher standards of service than formerly. Both of these factors are exerting an influence on operating methods that is reflected in shortened schedules for both freight and passenger trains; in new designs of cars and locomotives; in new methods of collecting and delivering freight; in pick-up and delivery service; and in many other improvements and changes in operating methods.

These changes in operating methods and equipment have been accompanied by a corresponding need for additional facilities and for the reconstruction of existing facilities which ramifies into practically every classification of the fixed property, including revision of alinement, passing sidings, yards, terminals, shops, power plants, locomotive-handling facilities, car-repair and maintenance facilities, inspection facilities, servicing facilities, fuel and sanding plants, water stations, ash-handling plants, offices, freight houses, station and other buildings, bridges, signals and other structures and service facilities.

Line Revisions Needed

For illustration, whereas grade reduction formerly constituted an important item in construction programs, the present need is rather for revisions of alinement to reduce or eliminate curvature, for curvature constitutes a serious obstacle to high-speed passenger-train operation, and those roads that have placed such trains in service have felt a pressing need for eliminating curvature that prevents sustained high speed. While necessity has already forced a certain amount of line revision, a large volume of this work remains to be done, and as more of these fast trains are placed in service, this need will increase.

Changes in operating methods, as well as radical changes in train schedules, generally create a need for additional passing sidings and, in many cases, for extensions to those already in service. With the advent of centralized traffic control, particularly on single-track lines, passing sidings become of paramount importance, for they are used in such a manner that trains are able to meet or pass with minimum delay. These tracks must be constructed and maintained to a standard that will allow speeds far higher than have heretofore been necessary. They must also be longer so that trains will

not be required to stop while the meet or passing movement is being executed. This method of operation also requires the installation of power-operated, remotely controlled switches and longer turnouts to avoid stopping trains before entering or leaving the sidings and to make higher speeds through the turnouts practicable.

Many Yards Obsolete

New requirements for handling traffic are more far reaching in their effect on yards and terminals than on other operating facilities, and recent changes in operating methods have created a need for yard construction and reconstruction that cannot be met at present. Formerly, freight trains passed through and were broken up at every intermediate terminal. The present trend is to make up trains at the originating terminal or at some convenient point enroute, and send them through to destination with little further switching, except to set out and pick up cars at stipulated points. Another trend that is gaining momentum is to remove as much switching as practicable from metropolitan areas and concentrate it at points removed from large centers of population.

These changes in operating methods, while spoken of as trends because at present, by reason of lack of funds, they cannot be developed to the point of full effectiveness, represent a real need if traffic is to be moved promptly in accordance with public demand. In other words, little advantage can be gained in expediting the movement of trains between terminals if they must be handled in obsolete yards where the time gained on the road is lost by reason of facilities that were designed for conditions that no longer exist. So rapidly have the requirements for yard operation changed that yards which represented the last word in design as recently as 25 years ago, and relatively few are of later design, are incapable of handling present day traffic expeditiously or economically.

The needs include rearrangement of tracks, new or revised humps, the installation of car retarders, interlockings and remotely controlled switches, yard lighting, communication systems of several types, and rearrangement of offices in existing yards. In not a few instances, however, these needs involve completely new plants embodying the foregoing requirements and many other features not mentioned, such as weighing, inspection, icing, car-repair and engine-handling facilities.

Passenger Stations in Poor Condition

Owing to a long period of constantly declining passenger revenues, the construction and remodeling of passenger stations practically ceased for a number of years. Again, as the result of the severe shrinkage in all revenues during the present decade, the railways have been forced to neglect building maintenance. For these reasons, in the face of increasing traffic, the railways are now compelled to handle passengers through stations that are obsolete and, in many cases, unfit for the purpose. In plumbing, in heating and in other ways, many railway stations are outmoded. While the railways have been desirous, especially from a public-relations standpoint, of maintaining station buildings and their equipment to a high standard, they have faced the alternative of neglecting either these or the structures which affect the movement and safety of trains.

Freight houses likewise comprise one of the most important of railway facilities, for it is through them that much of the freight is received and delivered. There are 40,000 combined freight and passenger stations and 10,000 separate freight houses. As traffic began to fall off subsequent to 1929, the need for remodeling, enlarging and replacing these freight houses also ceased for a time, for they are among the first of the railway facilities to feel the effect of fluctuations and changing conditions of traffic. However, as traffic began to increase, the need for a large amount of remodeling, enlarging and replacing of freight-house facilities has again arisen, especially to adapt them to the newer methods of handling freight. For illustration, one road has already completed plans for the replacement of its freight-house facilities in an important city, at a cost of several million dollars, and is waiting to authorize the project as soon as the necessary funds become available. Similar conditions prevail with reference to shops, engine-houses, power plants, cinder-handling plants and other locomotive and car-repair facilities that constitute the heart of the railway transportation machine.

Life of Fuel Stations Short

Fuel is as important to a locomotive as food is to man, for fuel and food provide the energy which enables them to function. For this reason, fuel stations hold a position of importance in railway operation that is seldom realized by other than transportation officers and men engaged in train service. The physical life of most of the coaling stations heretofore installed by the railways is relatively short while, because of rapid improvement in design, they become obsolete almost as quickly. During the last two or three years a number of locomotive coaling and sanding plants have been constructed to replace those that were no longer able to function. Yet, these replacements have been small compared with the replacements needed.

Water, like fuel, is a prime necessity for locomotive operation, for which reason the supply must be both dependable and of a quality suitable for boiler purposes. Between 1910 and 1930 all but a few of the more than 18,000 water stations supplying water to locomotives were rebuilt or replaced. Yet today, much of the improvement work done during these two decades has been made obsolete by the changing methods of handling traffic. Longer locomotive runs, larger engine tanks and faster schedules are creating a need for greater spacing between water stations, and at the same time are making heavier demands on those stations at which water is taken. New pumping and power units, service storage of greater capacity and means for faster delivery of the water to locomotives are becoming more and more necessary to meet these increasing demands. In not a few instances a complete revision of the water-softening facilities is also pressing for attention, to insure that the quality of the water supplied to locomotives will be more uniform, for under the new conditions of operation, water softening is no longer a problem of the individual plant but must be co-ordinated to insure a uniform supply over these extended locomotive runs.

The facilities that have been referred to here are typical of many others but they are sufficient to show the dire need of the railways for reconstruction, replacement and expansion of their fixed properties. The changes in industry and in methods of distribution which have been occurring in recent years are by no means completed, but are continuing at a rate that will also eventually make obsolete many more facilities which today are still adequate and satisfactory. It is obvious, therefore, that there is at present a highly suppressed demand for an extraordinary volume of railway construction and that this demand will grow in magnitude and insistence until money becomes available for a vast program of construction.

Work Equipment— A Door to Economy

As Rail Was Handled a Few Years Ago

ALTHOUGH the adaptation of mechanical equipment to maintenance of way operations has made tremendous strides during the last ten or fifteen years as railway managements have come to realize its possibilities for large economies, two developments within recent months have given this equipment new and additional impetus. These are the increases in wages granted employees in maintenance of way service on August 1 and the success of the efforts of the train service brotherhoods to "make work" for their members by forcing their placement on much rail-mounted work equipment as additional forces.

Higher Wages Increase Economy

In any consideration of mechanical or work equipment, the first consideration is, of necessity, that of economy. This is effected, of course, through the replacement of men. The magnitude of the economy effected varies with the wages paid. Obviously, the higher the scale of wages is, the greater is the economy possible —and the greater is the incentive for the replacement of labor with machinery.

Prior to the recent adjustment in wages, the average hourly rate paid maintenance of way (track) labor approximated 35 cents. The increase of 5 cents an hour increases that rate approximately 15 per cent. Such an increase in the cost of labor adds proportionately to the savings effected by equipment already in use. It also brings into the picture additional equipment that could not previously be justified on grounds of economy. From all points of view it cannot do other than provide strong additional incentive for the further development and use of machinery for maintenance of way operations.

Machines Take the Drudgery Out of Spike Driving

Added Men Increase Costs

The second development is also largely of the last year. It originates with the numerous decisions that the Boards of Adjustment are handing down in actions brought by the train service brotherhoods to place members of their crafts on many units of work equipment operating on main tracks, which units have heretofore been so used with flag protection provided by the gangs. This campaign, which grew out of the depression with its reduction in employment among train service employees in common with those of other branches of railway service, has resulted in numerous orders from these Boards of Adjustment, that conductors and enginemen be placed on units of equipment working on the main track that cannot readily be removed from the track.

In general, these train service men perform no work that has heretofore been done by other men. They constitute, therefore, an added cost of operation for this equipment—and a cost that is disproportionately high because of the great disparity between the wages that they receive and those paid the maintenance of way forces. The result is to reduce and, in not a few cases, to eliminate the economy of this equipment. This in turn is providing a strong incentive for its replacement with off-track equipment that is free of these restrictions and this added cost.

A Recent Development

The use of work equipment is a relatively recent development in maintenance of way activities, a field in which brawn has long been regarded as the prime requisite, especially of the track man. It is less than 27 years since the first roadmaster's district was fully equipped with motor cars—that part of the Chicago-and-Council Bluffs division of the Milwaukee between Elgin, Ill., and Savanna. Yet, today the motor car is almost universally accepted as a standard unit of equipment for maintenance gangs and more than 50,000 of these cars are now in service.

Here the main objective was the elimination of the laborious work of pumping its predecessor—the hand car—over the territory, frequently against head winds and ascending grades. The relief of the men was so great that few gangs would today tolerate a return to the hand car. A secondary advantage is, of course, the transportation of the men to their work in a shorter

period of time and their arrival fresh for duty. Other incidental advantages include the greater mobility of forces.

In like manner, the tie tamper has won a place for itself by reducing drudgery in another task. It has also shown the added advantage of more uniform and permanent work at a time when these characteristics are becoming increasingly desirable. The tie-adzing machine offers an advantage in still another direction—safety, for hand adzing was productive of many injuries. It also presents the advantages of increased speed, greater accuracy of workmanship and reduced destruction of ties. Still another advantage is presented by the cranes developed for use in laying the heavier rail—such a machine with a half dozen men will do the work of five times that number not so equipped and do it faster and with greater safety.

Nor is the development in work equipment confined to the track department, for the progress in this direction is equally pronounced in the bridge and building field. Here the mechanical paint spray, the power saw and other power-driven tools, the air compressor and the power trench pump illustrate the same development.

In spite of the progress that has already been made, the introduction and acceptance of work equipment have by no means reached the point of saturation. In many respects, they are yet in their early stages. There are many operations that are still performed without mechanical aid because no such aid has yet been developed. There remain many opportunities—and many demands—for new and improved equipment.

Obsolete Equipment

Furthermore, much of the equipment in use today is obsolete, either because of age or because of a change in the conditions under which it is used. One may refer again to the motor car. Ten years ago the six-man gang was the typical gang for sections and the motor car was designed for use and for handling by this force. Of late, however, much of the work formerly handled by section gangs has been turned over to floating gangs, specially organized and equipped for the task, and the section gang on many roads has been reduced to two or three men. Obviously, the large car is no longer required for this gang. On the contrary, it may actually be unsafe and should be replaced by a lighter car.

Also equipment that is still as efficient as when originally purchased is being made obsolete by the development of newer and still more efficient units. Take the steam shovel as an illustration. A couple of decades ago most large roads maintained and operated a number of steam shovels in routine improvement work. These shovels may still be able to handle dirt as cheaply as ever. Yet they have given way to lighter and more mobile shovels and draglines, frequently crawler mounted, that require less auxiliary equipment and that are much more economical to operate. And what has happened to the steam shovel is happening to many other units of equipment.

Changing Needs

The requirements of maintenance of way work are changing rapidly today. Especially is this true with regard to the refinements with which this work must be done to provide that smoothness of line and surface that are required by the super-speed trains of today—and at the same time give that permanence of construction that will withstand the blows of freight trains moving at passenger train speeds.

Four Men and a Crane Do the Work of 16 to 20 Men

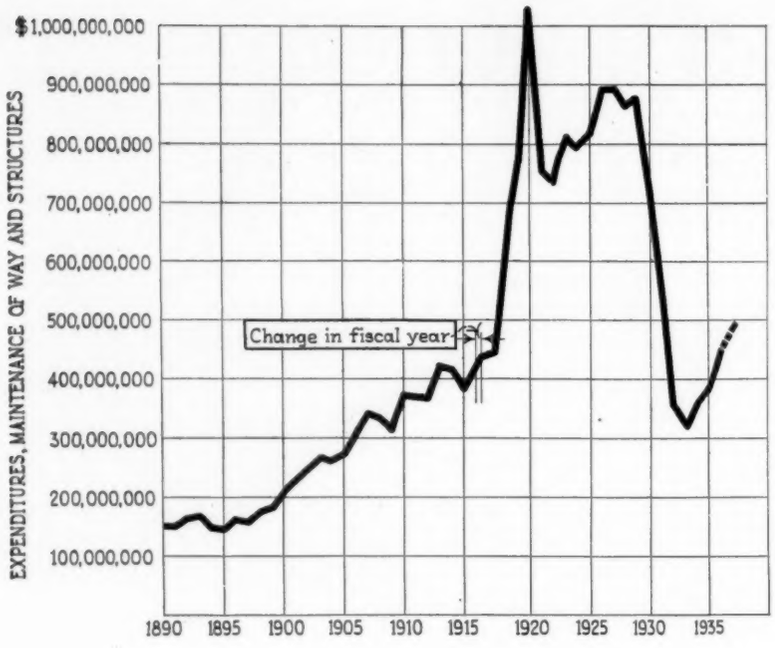
Such track can be put up only by mechanical equipment. Furthermore, much of this work is so laborious that men, if available, are unwilling to accept the drudgery. All these conditions point to the necessity for an adequate complement of modern equipment, designed to meet the needs of today's traffic.

The Cost

Such equipment costs money. It has been estimated that the investment in work equipment already exceeds $100,000,000. Spurred on by increased earnings early in the year, the roads purchased more than 3,300 units of new equipment during 1937, involving a total outlay of more than $5,000,000—and even these purchases were entirely inadequate for their needs.

The railways appreciate the economies possible through work equipment. They recognize that changing conditions are intensifying the need. Their purchases during recent months demonstrate their determination to buy up to the limit of their resources. Their attainment of further economies in this direction is limited by their earnings. Given larger earnings, their expenditures for work equipment will increase—and the economies in operation derived therefrom will grow in proportion.

Small Mobile Cranes Have Made the Steam Shovel Obsolete



Expenditures for Maintenance of Way and Structures, Class I Railroads—1890 to 1937

A Billion Dollars Behind

in Maintenance of Way and Structures

IN the five years ending with 1929, the Class I railroads (excluding switching and terminal companies) spent an average of $849,020,923 a year for maintenance of way and structures. In the seven years, 1931 to 1937, inclusive, the average annual expenditure was about $415,000,000. In other words, during the last seven years the railroads have spent only 49 per cent as much money annually for the upkeep of their fixed properties as they spent annually in the last five years of the "twenties."

How Far Behind?

In considering the effect of this sharp decline in maintenance of way activities in terms of deferred maintenance it is necessary to bear in mind that requirements for upkeep are influenced by the volume of traffic handled, and that on the basis of gross ton-miles (including locomotives), the traffic in the seven years 1931 to 1937, inclusive, was about 27 per cent less per year than the average for the years 1925 to 1929. This reduction must be taken into account in accordance with the commonly accepted criterion that about 30 per cent of maintenance of way expenditures is affected by use.

Furthermore, the aggregate charges to maintenance of way and structures include some operating charges on account of improvement work, and since far less improvement work was done during the depression, the total outlays during the years since 1930, were less proportionately than in previous years by reason of smaller charges on that account.

In addition, marked advance has been made in the efficiency with which maintenance work is performed. Economies have been realized also as the result of using better materials. Wood preservation has resulted in a longer life of crossties. Real but less tangible benefits have been derived from the use of stronger construction in rails, track fastenings and special trackwork, while the repair and heat treatment of rail ends have greatly increased the interval of time between successive rail replacements.

There are, of course, certain activities, the neglect of which has little cumulative effect. Weed mowing, the dressing of track and the care of station grounds, for example, can be neglected in one year without incurring materially greater expense for the same operation in subsequent years. However, in many other elements of upkeep, such as the repair and painting of structures, "a stitch in time saves nine."

A Billion Dollars

Thus it is evident that any attempt at a statistical determination of the extent of deferred maintenance leads into devious ramifications. Yet, such an analysis, taking into account all of the more tangible elements involved and making generous deductions for the intangible factors, indicates an accrued deficiency in the expenditures of the railroads for maintenance of way and structures of at least a billion dollars, or twice the outlay of the Class I railroads in 1937.

Some measure of the extent to which this aggregate deficiency is distributed among the various elements of the fixed properties is afforded by the table showing the breakup of the expenditures for the years 1930 to 1936, inclusive, compared with the corresponding figures for the average of the five years 1925 to 1929, inclusive. No comparable figures are yet available for 1937. While any attempt at a quantitative determination of the accrued deficiency in the expenditures under these various

heads would be fraught with serious difficulties, it is evident that the deficiencies run into large figures.

Rails and Ties

More tangible evidence is to be had in the case of the two major items involving expenditures for renewals, namely, rails and ties. The tons of rails laid in replacement by Class I railways, excluding switching and terminal companies, from 1925 to 1937, inclusive, were as follows:

	Gross Tons		Gross Tons
1925	1,950,146	1932	394,536
1926	2,209,873	1933	403,254
1927	2,124,765	1934	631,093
1928	2,080,277	1935	582,794
1929	1,958,489	1936	921,298
1930	1,517,002	1937	1,030,000*
1931	984,900		

* Estimated.

It is generally conceded that the wear and tear on rail is directly proportional to the volume of traffic. However, owing to improved practices developed by the railways to obtain longer life from rail, the relationship between traffic and renewals has not been a constant. Just how much the improvement that has been made in methods for the conservation of rail since 1929 has affected the new rail requirements is not determinable. However, study indicates an accrued deficiency of about three million tons at the end of 1937.

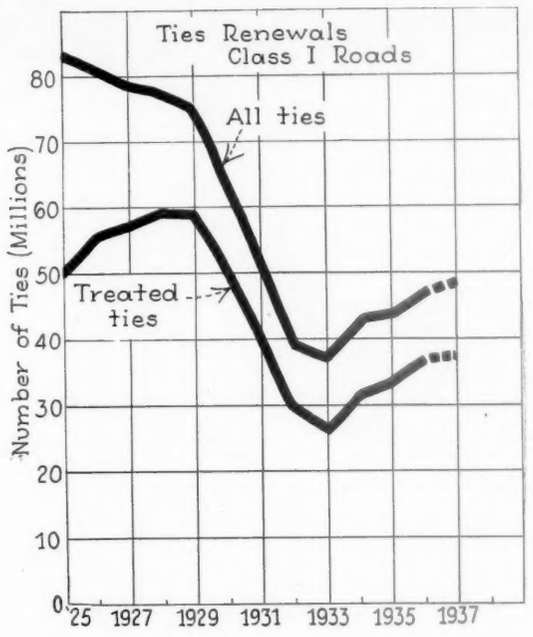
Crossties Applied in Renewals—Class I Roads

1925	82,716,674	1932	39,190,473
1926	80,745,509	1933	37,295,716
1927	78,340,182	1934	43,306,205
1928	77,370,491	1935	44,351,900
1929	74,679,375	1936	47,361,015
1930	63,353,828	1937	48,000,000*
1931	51,501,659		

* Estimated.

Likewise between 1925 and 1929, inclusive, the Class I roads renewed an average of 78,770,446 crossties per year. As shown in the table, the renewals in subsequent years declined markedly, reaching the low level of 37,295,716 ties in 1933, and increasing only to 47,361,015 ties in 1936, and to around 48,000,000 in 1937.

Crosstie requirements are influenced both by the mechanical damage resulting from traffic and by natural causes resulting in decay. Moreover, the latter influence has been retarded in recent years by the use of increasing proportions of treated ties. After taking both of these factors into account, there is indicated an accrued deficiency of renewals amounting to about 90,000,000 crossties, or nearly twice the renewals made in 1936 or 1937.



Crossties Inserted in Existing Tracks by Class I Railroads

Effect of Greater Speeds

No discussion of deferred maintenance is complete which does not consider the marked increase in the speed of trains, both passenger and freight, that has taken place during the very period in which expenditures for maintenance has been so drastically curtailed. And the smooth performance of these fast trains is ample evidence of the high quality of line and surface maintained on the tracks over which they operate. But in the light of the limited expenditures of individual roads and the roads as a whole, there is no alternative but to assume that increasing proportions of funds allotted to track maintenance are being allocated to the fast tracks.

Faced with drastic retrenchment, maintenance of way officers have had to "rob Peter to pay Paul." Maintenance work that could be deferred without reducing the effectiveness or the safety of the property has been

Expenditures for Maintenance of Way and Structures, Class I Railways

(Thousands)

	Average 1925-1929 (Inclusive)	1930	1931	1932	1933	1934	1935	1936
Superintendence	$57,262	$57,198	$49,324	$36,552	$31,921	$33,347	$35,605	$37,357
Roadway Maintenance	83,698	64,794	48,575	32,042	30,026	30,714	35,809	38,289
Tunnels	2,608	2,087	1,774	1,466	933	1,051	1,453	1,326
Bridges, Culverts, etc.	43,471	37,612	28,123	19,434	17,627	20,139	22,646	24,032
Ties	114,859	91,224	72,651	50,294	43,543	50,748	51,936	56,315
Rails	47,402	34,639	25,960	13,762	14,324	15,418	16,302	21,192
Other Track Materials	48,354	36,296	26,505	15,726	15,362	18,694	20,959	26,732
Ballast	19,379	13,262	8,601	4,969	5,814	7,538	8,357	11,992
Track Laying and Surfacing	211,067	172,136	131,274	83,407	77,025	85,641	94,033	106,072
Fences and Snow Sheds	5,831	4,494	3,119	2,135	2,047	2,412	2,260	†3,397
Crossings and Signs	13,115	12,632	9,656	6,468	5,969	7,293	7,186	*
Buildings	79,000	63,836	42,539	24,924	24,576	31,448	33,047	41,252
Water Supply	10,444	8,944	6,299	3,952	3,749	4,441	4,497	5,860
Tools and Equipment	18,230	16,534	11,834	7,917	8,051	10,666	11,044	13,452
Injuries	5,907	5,424	3,941	2,811	2,417	2,810	2,727	3,118
Removing Snow, Ice and Sand	9,947	7,713	4,343	4,699	4,188	5,630	7,001	13,365
Miscellaneous	78,449	65,432	56,095	40,621	34,714	37,310	39,105	51,059
Total	$849,021	$705,471	$530,613	$351,179	$322,286	$365,300	$393,967	$454,810

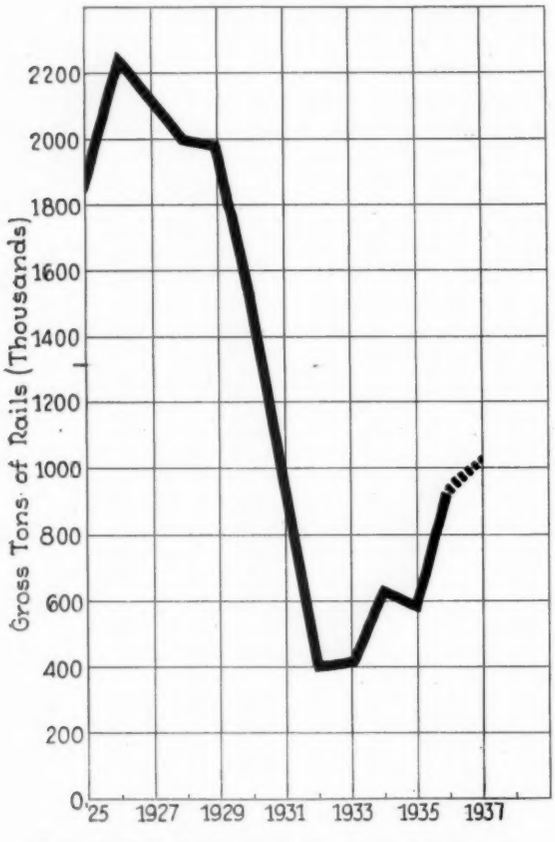
NOTE: Miscellaneous includes signals and interlocking, all charges for depreciation and unclassified items.
* Not shown separately in 1936.
† Includes, signs, as well as fences and snow sheds.

postponed in order that the maximum allotments could be made to items of upkeep that were of a more vital nature. Normal distributions of the maintenance dollar were modified to the end that nearly as much, or even more, money could be spent for such items as repairs and tie renewals and less for rail, other track materials and ballast. In the same way more money was spent on bridges and less on buildings. This trend is indicated in the above table.

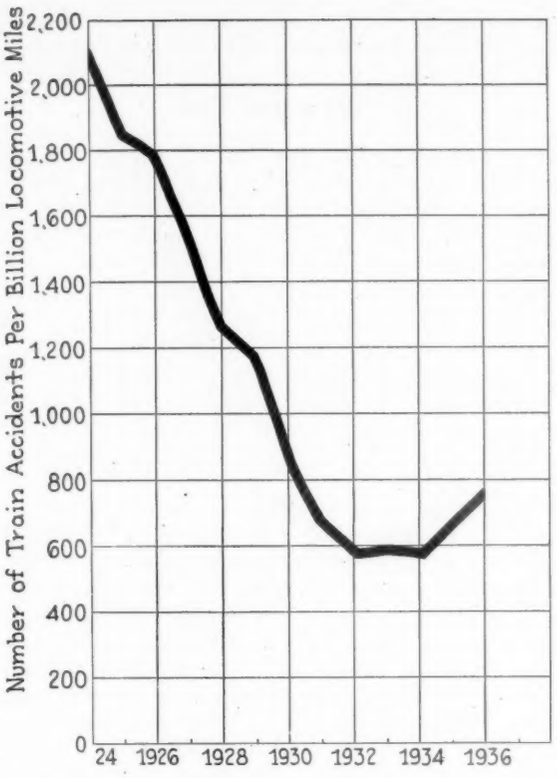
	Proportions of the Maintenance Dollar Spent for Different Purposes—in Cents	
	Average Five Years 1925-29	Average Six Years 1931-36
Roadway Maintenance, and Track Laying and Surfacing	34.8	33.5
Bridges, Culverts, etc.	5.1	5.4
Ties	13.5	13.5
Rail	5.6	4.4
Other Track Materials	5.7	5.1
Ballast	2.3	1.9
Buildings	9.3	8.2

What of Safety?

Thus, while it is generally admitted that there is an urgent need for greatly expanded programs for replacements and that much larger expenditures should be made for the repair of those elements of the property, the condition of which does not influence the effectiveness and safety of operations, it has been contended that the tracks and bridges are in excellent condition so far as safety is concerned. But is this sanguine attitude fully justified? The railroads enjoy an enviable reputation for safety of operation, and especially so because of the marked reduction in the accidents during the last two decades. But has the downward trend continued unbroken during the present decade? In the light of this question, it is well to investigate the record, so far as it relates to train accidents ascribed to defects in or improper maintenance of way and structures.



Rails Laid in Replacement by Class I Railroads



Train Accidents Ascribed to Defects in or Improper Maintenance of Way and Structures—Per Billion Locomotive and Motor-Train Miles

What Does This Show?

Other things being equal, train accidents vary with the volume of traffic, which, for this purpose, may be expressed in terms of locomotive miles or gross ton-miles. Using the former as a criterion it is found that the number of train accidents ascribed to defects in or improper maintenance of track or structures declined from 2,090, per billion locomotive and motor train miles, in 1924, to 1,175 in 1929 and to an average of 581 for the three years 1932-33-34, but that they then increased to 679 in 1935 and to 760 in 1936. The use of gross ton-miles as the basis of comparison discloses the same upward trend for 1935 and 1936.

That this upward trend in 1935 and 1936 is not the result of any freak condition is apparent from the fact that it appears also in all of the major sub-classifications except one—ties and tie plates. Accidents due to defects in rails and rail joints, frogs and switches, improper line and surfaces, for example, were all more numerous, relatively, in 1935 and 1936 than in the three earlier years.

Will Spend More, If

It is possible that the corresponding data for 1937, which are not yet available, may not show a continuation of this upward trend of accidents. However, whether they will or not, facts already at hand offer adequate support for the conclusion that the railways are far behind in the upkeep of their tracks and structures. That they will greatly expand their programs for maintenance of way, as soon as earnings are increased, is self evident.

Trains Cost Money

THE outstanding accomplishment of the United States railroads last year in the way of service was the installation of 15 new streamlined or high speed trains, which brought the total number of these new trains in service to 54. In 1936, by way of contrast, 14 such trains were placed in service in the United States and 8 in Canada. The inauguration of these trains was accompanied by a general speeding up of schedules of many other trains.

By this action the roads of America are increasing their lead over the railroads of other countries. In 1937, as in previous years, they operated the largest fleet of fast passenger and freight trains, more streamlined trains and more air-conditioned cars than the railroads of all other countries combined.

At the end of the year more than 10,000 air-conditioned passenger cars were in service, as compared with about 8,000 in 1936. On October 1, the railroads had 5,196 and the Pullman Company 4,666 air-conditioned passenger cars in operation.

The railroads of the United States and Canada are continuing to improve their service in this aggressive manner in the face of entirely inadequate earnings. They are pursuing this policy in the belief that they will be rewarded by more liberal treatment from the public and public regulatory bodies.

These new trains cost large sums. The roads are warranted in making these expenditures for super service only to the extent that funds are made available. Increased rates will contribute to this end.

Fifty-four Streamlined or High-Speed Trains Inaugurated Since 1934

Train	Railroad	Between	Placed in Scheduled Service	Type of Motive Power	Type of Equipment	Revenue Cars
Pioneer Zephyr No. 9900	C. B. & Q.	Lincoln-Omaha	11-11-34	D	LW	†3
(Dinette-coach to be added in June, 1938, will increase number of cars to †4)						
"400" (2 trains)	C. & N. W.	Chicago-Twin Cities	1-2-35	S	ST	8
City of Salina	U. P.	Kansas City-Salina	1-31-35	Distillate-El.	LW	†3
Flying Yankee	B. & M.-Me. C.	Boston-Bangor	4-1-35	D	LW	†3
Twin Zephyrs (2 trains Nos. 9904 and 9905)	C. B. & Q.	Chicago-Twin Cities	.....	D	LW	7
(Dinette-coach added on Sept. 8 and 10, 1937, increased the number of revenue cars from 6 to 7. Trains 9901 and 9902, placed in service on Apr. 21, 1935, were replaced by trains 9904 and 9905 on Dec. 18, 1936)						
Twin Cities Hiawatha (2 trains)	C. M. St. P. & P.	Chicago-Twin Cities	.....	S	LW	9
(Equipment of 8-car trains placed in service on May 29, 1935, replaced by 9-car trains on Oct. 11, 1936)						
Comet	N. Y. N. H. & H.	Boston-Providence	6-5-35	D	LW	‡3
City of Portland	U. P.-C. & N. W.	Chicago-Portland	6-6-35	D	LW	6
Royal Blue	B. & O.	Washington-Jersey City	6-24-35	S	LW	8
(Re-equipped on Sept. 26, 1937, for third time)						
Abraham Lincoln	Alton	Chicago-St. Louis	7-1-35	D	LW	8
Rebel (2 trains)	G. M. & N.	New Orleans-Jackson	7-10-35	D	LW	†4
Mark Twain Zephyr No. 9903	C. B. & Q.	St. Louis-Burlington	10-28-35	D	LW	†4
Super Chief (sleeper train)	A. T. & S. F.	Chicago-Los Angeles	.....	D	LW	9
(8 ST cars placed in service on May 12, 1936, replaced by 9 LW cars on May 18, 1937)						
City of Los Angeles	U. P.-C. & N. W.	Chicago-Los Angeles	5-15-36	D	LW	9
Green Diamond	I. C.	Chicago-St. Louis	5-17-36	D	LW	4
North Woods Hiawatha	C. M. St. P. & P.	Chicago-Star Lake	.....	S	LW	7
(Standard equipment placed in service on June 5, 1936, replaced by cars from Twin Cities Hiawatha on Oct. 11, 1936)						
City of San Francisco	U. P.-S. P.-C. & N. W.	Chicago-San Francisco	6-14-36	D	LW	9
City of Denver (2 trains)	U. P.-C. & N. W.	Chicago-Denver	6-18-36	D	LW	10
*International Limited (2 trains)	C. N.	Montreal-Sarnia	7-1-36	S	ST	12
*Mapleleaf (2 trains)	C. N.	Montreal-Sarnia	7-1-36	S	ST	12
Mercury	N. Y. C.	Cleveland-Detroit	7-15-36	S	LW	9
Besler	N. Y. N. H. & H.	Bridgeport-Hartford	8-1-36	S	LW	†2
*Royal York	C. P.	Detroit-Toronto	9-27-36	S	LW	4
*Canadian Pacific (2 trains)	C. P.	Montreal-Quebec	9-27-36	S	LW	4
*Chinook	C. P.	Calgary-Edmonton	9-27-36	S	LW	4
Auxiliary Twin Cities Hiawatha	C. M. St. P. & P.	Chicago-Twin Cities	10-11-36	S	LW	8
(Equipment includes cars of original Hiawatha and is operated as extra section of Twin Cities Hiawatha)						
Denver Zephyrs (Nos. 9906 and 9907)	C. B. & Q.	Chicago-Denver	11-7-36	D	LW	10
(From May 31 to Nov. 7, 1936, trains Nos. 9900 and 9903 were operated as the Advance Denver Zephyrs. Dinette-coach to be added in June, 1938, will increase number of revenue cars to 11)						
Sam Houston Zephyr (No. 9901)	C. B. & Q.	Fort Worth-Houston	12-1-36	D	LW	†4
(One car added on Dec. 1, 1936, increased the number of revenue cars from †3 to †4)						
Ozark State Zephyr (No. 9902)	C. B. & Q.	St. Louis-Kansas City	12-20-36	D	LW	†4
(One car added on Dec. 20, 1936, increased number of revenue cars from †3 to †4)						
15 Trains Installed in 1937						
*Daylight (2 trains)	S. P.	Los Angeles-San Francisco	3-21-37	S	LW	12
Chippewa (2 trains)	C. M. St. P. & P.	Chicago-Iron Mountain	5-28-37	S	LW	6
Forty-Niner	C. & N. W.-U. P.-S. P.	Chicago-San Francisco	7-8-37	S	ST	8
Ann Rutledge	Alton	Chicago-St. Louis	7-26-37	S	LW	9
Texas Rocket	C. R. I. & P.	Fort Worth-Houston	8-25-37	D	LW	3
Sunbeam (2 trains)	S. P.	Houston-Dallas	9-19-37	S	LW	8
Peoria Rocket	C. R. I. & P.	Peoria-Chicago	9-19-37	D	LW	4
Des Moines Rocket	C. R. I. & P.	Des Moines-Chicago	9-25-37	D	LW	4
Twin Cities Rocket (2 trains)	C. R. I. & P.	Twin Cities-Kansas City	9-25-37	D	LW	3
Denver Rocket	C. R. I. & P.	Denver-Kansas City	10-18-37	D	LW	3
	Reading	New York-Philadelphia	12-13-37	S	LW	5
City of Los Angeles	U. P.-C. & N. W.	Chicago-Los Angeles	12-27-37	D	LW	14
More Streamlined Trains Will Be Installed in 1938						
City of San Francisco	U. P.-S. P.-C. & N. W.	Chicago-San Francisco	Jan., '38	D	LW	14
Rebel No. 3	G. M. & N.	Mobile-Jackson	Jan., '38	D	LW	†3
*Chief	A. T. & S. F.	Chicago-Los Angeles	1-31-38	..	LW	12
San Diegan	A. T. & S. F.	Los Angeles-San Diego	2-15-38	D	LW	5
Super Chief (sleeper train)	A. T. & S. F.	Chicago-Los Angeles	2-20-38	D	LW	9
El Capitan (2 coach trains)	A. T. & S. F.	Chicago-Los Angeles	2-20-38	D	LW	5
*Twentieth Century Limited (4 trains)	N. Y. C.	New York-Chicago	About Apr., '38	S	LW	12
*Broadway Limited (2 trains)	Pennsylvania	New York-Chicago	About Apr., '38	S	LW	9

D—Diesel-electric.
S—Steam.
LW—Light weight.
ST—Standard equipment.
* Trains of the same name were operated with standard equipment prior to date shown.
† One combination motive power and revenue car included.
‡ One power plant in each end of train.

More Signaling—
Greater Economy

Automatic Signals Keep Trains Moving

THE pressure for higher speeds for both passenger and freight trains, for more exacting adherence to schedules, as well as for safety of travel, are today creating an insistent demand for the installation of added modern signaling facilities, not only on lines not now so equipped, but also in replacement of obsolete apparatus. This demand is accentuated by recognition of the further fact that the installation of up-to-date signaling will offer the solution for some of the major operating problems of the railroads, in that, with minimum capital expenditures, signaling will effect the maximum possible improvement in train schedules with the use of existing tracks and motive power, and will, at the same time, effect certain other savings in operating expenses. This is true, to a large extent, because the most economical way to reduce the overall time of trains between termini, or of cars between shipper and receiver, is to reduce or eliminate the time lost by unnecessary delays of these trains at terminals, junctions and passing tracks as well as delays to cars in classification yards.

To accomplish these objectives, new signaling facilities, to the extent of at least $20,000,000 annually for the next five years, are sadly needed by the railroads, and the interesting point is that these facilities, in the majority of instances, can be justified by the savings effected in operating expenses alone. The need is so apparent in this field that numerous cases can be cited in which investigations have already been made and the economies amply demonstrated, but the required expenditures cannot be made until the income of the railroads is increased sufficiently to re-establish the credit of the carriers.

Automatic Block Needed on Certain Lines

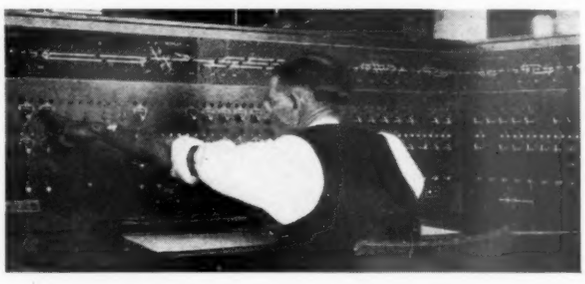
First consideration may be given to some 5,000 miles of main lines that are not yet equipped with automatic block signaling where such equipment can readily be justified by improvement in safety, increased track capacity and reduction in overall running time of trains, as well as by savings in certain operating expenses. In several instances, the installation of automatic signaling has been justified economically on lines handling as few as 10 scheduled trains daily.

Aside from the need for automatic signaling on certain lines not now so equipped, much of the signaling in service today is obsolete and seriously in need of complete replacement. Of the 93,757 miles of track equipped with automatic block signaling on January 1, 1937, more than 53,800 miles have been in service over 20 years. During that period, weights as well as speeds of trains have been increasing so rapidly that many signals are not now spaced to afford adequate train-stopping distances.

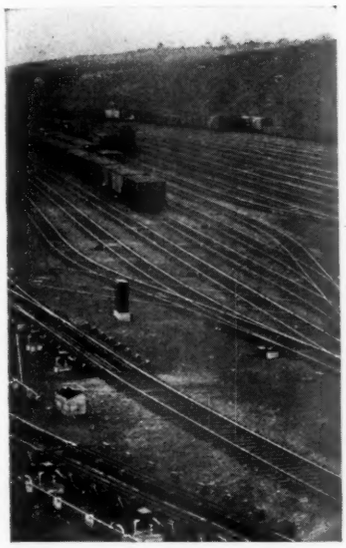
These increases in braking distance lead to changes in the signaling to afford safety of operation. If the blocks are lengthened without other changes, the track capacity is reduced, because trains must be spaced further apart and must run too great a distance at reduced speed under caution indications, as when approaching an interlocking or when closing up on a train that is just getting into the clear. To correct this condition, the automatic blocks must in many cases be respaced and new signals with four aspects installed. This means that the signaling on thousands of miles of line should be relocated and reconstructed if most efficient and economical operation is to be attained. Furthermore, on much of this mileage, old semaphores or even more antiquated disk signals should be replaced with modern efficient light signals.

That such a change contributes to improved train operation is shown by a study made by one road with an extensive mileage of well-maintained signals, which found that train detentions due to signal failures are twice as numerous on semaphore territories as on those equipped with light signals. When rehabilitating a signal system, it is likewise logical to replace the relays and other accessories with modern efficient instruments.

Many of the train delays and accidents can be prevented by continuously-controlled cab signaling. With cab signals an engineman immediately gets an indication as to more favorable conditions ahead, whereas with wayside signals only, he runs at reduced speed until arriving in view of the next signal. Especially where a freight train is following a passenger train that is stopping at stations, the use of cab signals permits more uniform speed of the freight train. Furthermore, on lines near the seacoast and in other locations where storms or fogs frequently obscure the engineman's view of wayside signals, as well as of trains ahead, if the engineman reduces speed to locate the signals and ascertain the aspects, all trains are delayed and schedules disrupted; otherwise accidents occur. For this reason, cab signaling is warranted on hundreds of miles of the more important



With Centralized Traffic Control One Man Directs Train Movement by Signal Indication Without Train Orders



Retarders Facilitate Operation of Classification Yards

main lines if the railroads are to render consistently on-time performance with safety.

Economies at Interlockings

The use of modern equipment has completely changed the application of interlocking. With mechanical interlocking, the area controlled from one tower was limited by the length of pipe and connections that could be handled by a manually-operated lever. When power interlocking was developed, the practicable distance of control was increased but was still limited by the expense for wiring standard circuit arrangements, and by the fact that one man could operate only a limited number of levers. With the development of code control, numerous switches and signals can now be controlled on a two-wire line circuit, thus removing this limitation as to distance, while the application of miniature non-interlocked-lever machines of the desk type permits the assembly of many levers on a panel within the reach of one man seated at a desk.

A more recent development, brought out in 1937, is the button-type route-control machine, by means of which an entire route can be lined up by the operation of only two buttons. Thus, by the application of modern equipment, two or more interlockings can be controlled from one point, thus facilitating and co-ordinating train movements and reducing operating costs materially. For example, at Delair, N. J., the Pennsylvania installed a new interlocking, by means of which the signals and switches formerly included in four separate interlockings are now controlled from the one machine.

C.T.C. at Bottle Necks

Another opportunity for signaling to effect marked economies is afforded on short sections of some lines, as well as occasionally on some entire operating divisions where the preponderance of train movements occurs during certain hours of the 24-hr. period. Likewise, on some lines, peak traffic prevails only during certain seasons. Under these circumstances, the use of automatic signaling and centralized traffic control for directing train movements so increases the capacity of a single-track line that it is frequently possible to defer the construction of a second track for years, while in some instances it has made possible the removal of sections of second track already built and thereby eliminated the cost of maintenance, estimated in one case to be $1,000 annually per track mile. On multiple-track lines an important advantage of centralized traffic control is that it enables trains to be run in either direction on any track, thereby permitting one train to be run around another, while all trains are kept moving.

Records show that C.T.C. installations are effecting reductions in overall running time of from 1 to 1.8 minutes per mile for each freight train operated, and that the saving in time is considerably more for trains operated during peak periods of traffic. These facts have been demonstrated on sections ranging up to 30 or 60 miles in length for several years, and the Burlington has recently completed a C.T.C. installation on a complete operating division of 112 miles.

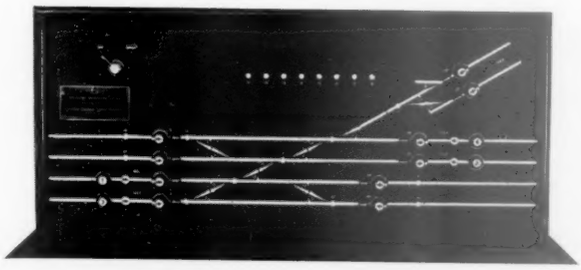
Quicker Freight Classification

The best efforts to get a freight train over the road are often defeated by yard delays. Here again signaling offers practical assistance through power-operated switches and retarders for classification yards. With such facilities, maximum peak capacity can be attained at all hours, regardless of the weather. The more prompt classification of cars for departing road trains or for delivery to industries is the result.

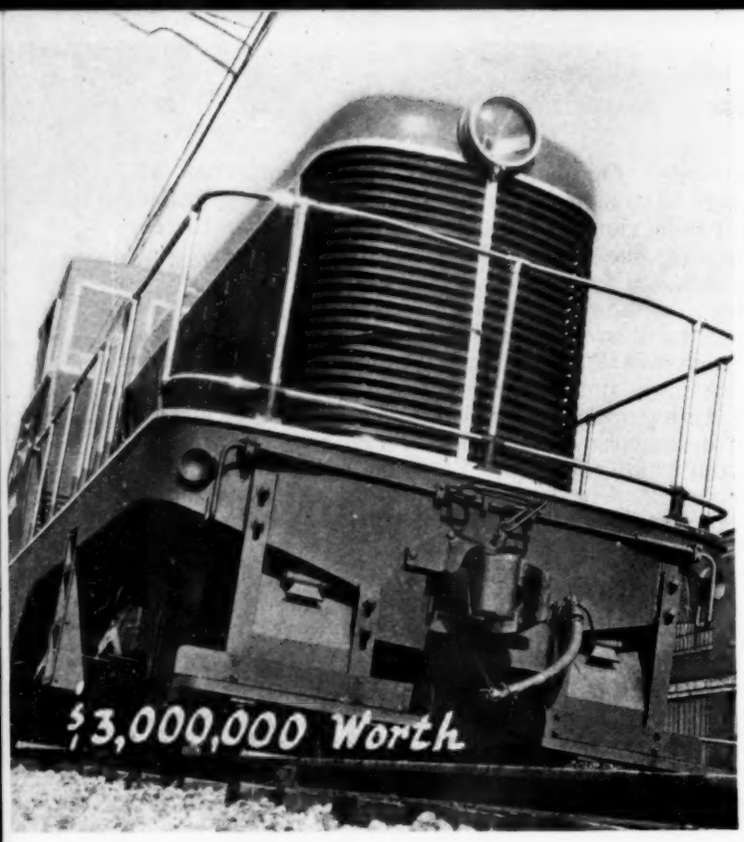
In addition, car retarders also reduce operating expenses by eliminating car riders and switchmen, as well as reducing the number of yard engines required. In one yard which handled 2,750 cars daily, operating costs were reduced from 43 cents to 18 cents per car, saving $200,000 annually, a return of 40 per cent on the investment for the retarder installation. Adequate information is available to prove the desirability of providing such facilities in not only many of the larger hump yards, but also in smaller yards.

As in signaling, likewise in the railroad communication field, many new types of equipment have been developed which will improve service economically. The railroads need wire-connected typewriting apparatus for handling freight consist lists and messages between offices concerning freight and passenger traffic. Carrier-current apparatus can be used to secure more circuits on existing line wires, thus improving the service economically. Telephone train dispatching is justified on extended mileages not now so equipped.

All of these developments, such as simplified interlockings, centralized traffic control, car retarders, and improved communication facilities, have been on the market for several years, but on account of limited earnings have been installed only where the needs were most obvious. The only obstacle which prevents the railroads, and indirectly the traveling and shipping public, from reaping the benefits available by the installation of these modern facilities, is the fact that the railroads do not now have the cash or the credit to enable them to purchase and install the apparatus. Increased earnings are the requisite for this improvement in service.



Button-Type Route Control Is One of the Modern Forms of Simplified Interlocking



WHAT THE RAILROADS ARE DOING ELECTRICALLY

The Paoli-Harrisburg extension of the Pennsylvania's electrification was authorized January 27, 1937, and the work is now nearly completed. It will cost $52,000,000 and is providing direct employment to 10,000 men.

Air conditioning, to a considerable extent an electrical department problem, has caused the railroads to invest something more than $10,000,000 a year for the past six years. The rate at which cars are being equipped has declined slightly, but much remains to be done to establish adequate service facilities.

Diesel-electric locomotives and cars ordered in 1937 represent an addition of $3,000,000 worth of electrical equipment to railroad service.

New alloy steels used in locomotive and car construction require accurate control of temperatures for heat treating, possible only with electric or electrically-controlled furnaces. Such control is also required for tempering and babbitting. These applications and the electric welding of rails offer new fields for electrical apparatus.

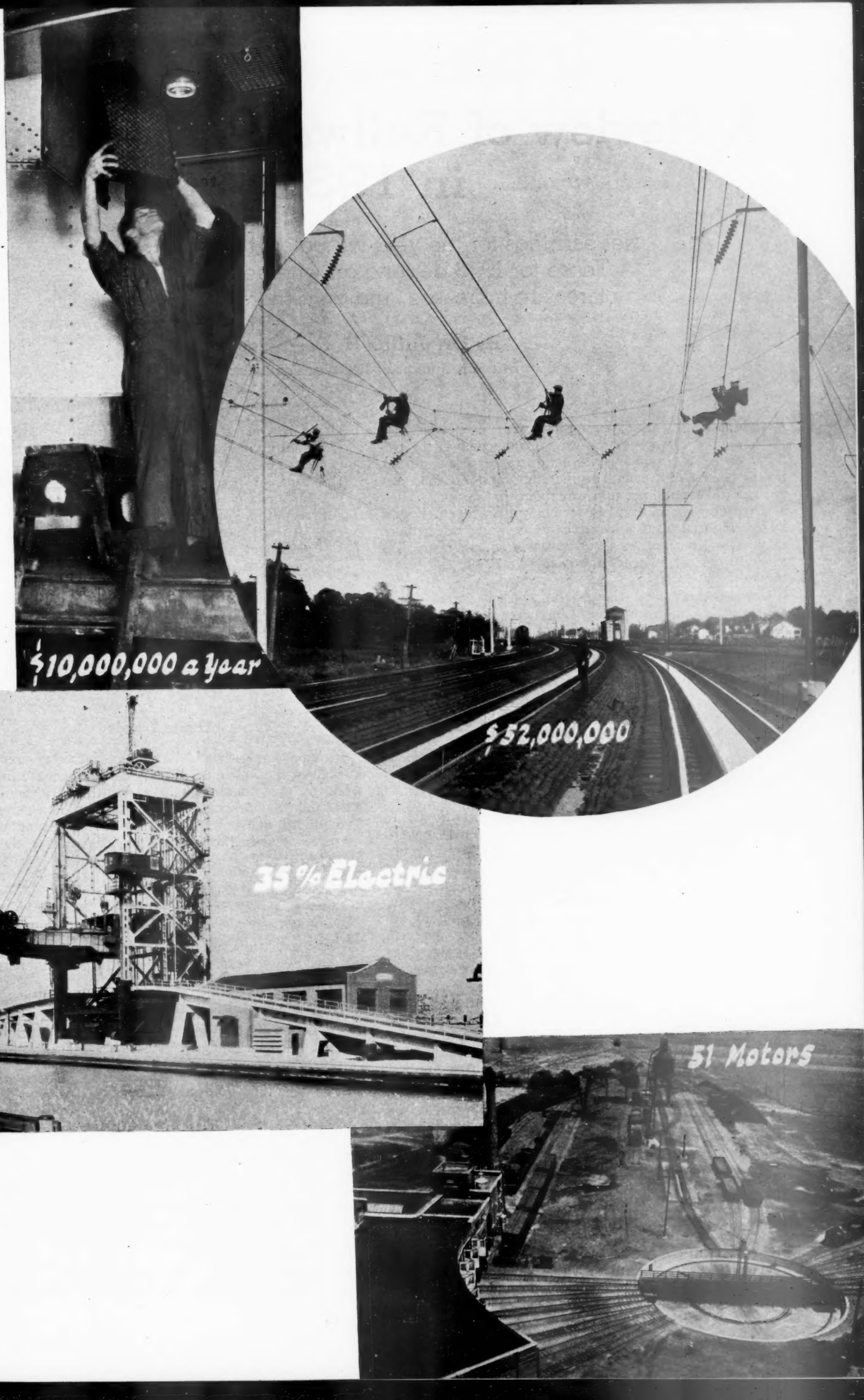
Lighting intensities in new and relighted cars and shops are two and three times those previously used. To see rather than to light has become the objective. At present the railroads use about 9,000,000 large-type lamps per year.

The engine terminal illustrated is a new one which turns 28 locomotives a day. The facilities require 51 electric motors.

Electrical apparatus for the car dumper shown costs approximately $175,000, thirty-five per cent of the total. On movable bridges the ratio is somewhat greater.

There are about 15,000 pumping stations, a large part of which can be improved by using electric power. Many must be relocated and enlarged to accommodate longer engine runs.

The foregoing items are offered simply as examples to indicate to what extent electrical investments are being added to the railroad capital account. Maintenance now requires about $14,000,000 worth of electrical equipment per year.


$10,000,000 a year
$52,000,000
35% Electric
51 Motors

A Review of Railway Operations in 1937

Net earnings for the year fell below those of 1936— Those for 1938 depend on whether rates and fares are increased, and on general business

By Dr. Julius H. Parmelee
Director, Bureau of Railway Economics

ENTERING the year 1937 with a considerable degree of hope, railway managements experienced a continued rise in operating costs during the first six months, with traffic and revenue rising just enough to keep the net up throughout that period. Then a sharp downward trend in freight traffic, together with added material costs and increases in wage rates, more than offset the increased net of the first half year. As a result, net earnings for the year as a whole fell below the levels of 1936.

Certain emergency charges on selected commodities, approved by the Interstate Commerce Commission in 1935, were canceled by order of the Commission on December 31, 1936, so that the railways opened the year 1937 with the handicap of a lowered freight rate level. In addition, the passenger fare reductions made effective by the Commission on June 2, 1936, applied to the traffic of the whole year of 1937. Despite these handicaps, railway revenues showed an increase over 1936 in each month from January to September, although at a gradually declining rate of increase. Then they turned downward, and ran below 1936 to the end of the year.

Meanwhile, the rise in material prices continued to the middle of 1937, following a consistent upward trend since 1933. Wage increases to two large groups of employees, became effective on August 1 and October 1, respectively. Railroad retirement taxes under the new taxing act of 1937 were made effective as of January 1, while the Social Security tax on account of unemployment compensation increased from one per cent of the payrolls in 1936, to two per cent in 1937. For these several reasons, operating costs were considerably higher in 1937 than in 1936.

The result of decreased net earnings on account of increased operating costs, aggravated by recession in traffic, was inevitable. Application was made to the Interstate Commerce Commission in November for authority to increase rates, and hearings on that application, docketed as Ex Parte No. 123, were under way as the year came to a close.

Other outstanding events of 1937 were the inauguration of a railroad retirement system, further improvement in railway services, and the development of a more sympathetic understanding of the meaning and importance of rail transportation on the part of the American public.

A birdseye view of the year as a whole would lead to the following summary:

The railways entered the year 1937 with—

(a) Prospects bright for increasing traffic volume, both freight and passenger.

(b) Loss in revenues approximating $10,000,000 monthly, because of expiration of emergency charges.

(c) Loss of revenues because of lowered passenger fare maxima ordered by the Commission in 1936.

The first half of 1937 reflected—

(a) Upward trend in traffic volume, both freight and passenger.

(b) Increased operating revenues, but at a somewhat lesser rate than that in traffic, although slightly greater than the increase in operating expenses.

The second half of 1937 produced—

(a) A reversal in traffic trends.

(b) Declining operating revenues.

(c) Increasing costs of operation.

(d) Increased wage rates.

Traffic Trends

Revenue carloadings showed an increase over 1936 in each of the first nine months, and a decrease in every week of the remaining three months. Revenue ton-miles followed the same general trend. The percentage change by quarters, therefore, is significant of the sharp reversal in the trend of business during the year, as follows:

	Carloadings	Ton-miles
First quarter	Inc. 15.1%	Inc. 20.5%
Second quarter	Inc. 13.2%	Inc. 14.4%
Third quarter	Inc. 5.4%	Inc. 6.4%
Fourth quarter	Dec. 8.4%	Dec. 10.2%

Passenger traffic retained its lead over 1936 throughout the whole year, although the rate of increase declined toward the end.

As will be brought out later, carloadings for the year 1937 as a whole increased 5.6 per cent over 1936, ton-miles increased 6.7 per cent, and passenger-miles increased 10.8 per cent.

Revenue Trends

The trend of freight revenue and of total operating revenues followed the same general course as that of freight traffic, except that the revenue increases of the first nine months were relatively less than the traffic increases; conversely, the revenue decreases of the last three months were relatively greater than the traffic decreases. This was due to the lower average revenue per ton-mile and per passenger-mile received by the carriers in 1937 than in 1936.

Generally speaking, the several items of revenue showed increases during the first three quarters of the

year, but decreased during the last quarter. The following statistics outline this situation.

	Freight Revenue	Total Revenue
First quarter	Inc. 14.7%	Inc. 13.6%
Second quarter	Inc. 9.0%	Inc. 9.4%
Third quarter	Inc. 2.0%	Inc. 2.9%
Fourth quarter	Dec. 11.8%	Dec. 10.1%

For the year as a whole, freight revenue increased 2.6 per cent, passenger revenue increased 7.4 per cent, while total operating revenues increased 3.3 per cent.

Material and Supply Costs

While the upward trend in material prices continued at a consistent rate from 1933 to the summer of 1937, there was a particularly heavy increase between October, 1936, and April, 1937. This was reflected in the wholesale price index of the United States Department of Labor, both for all commodities and for some of the commodity groups which particularly represent items purchased by railways in large amounts. Again, the price index of railway materials (other than fuel) developed by the Bureau of Railway Economics increased from 120.4 in October, 1936 (the average for May, 1933, being 100), to 141.9 in April, 1937, an increase of nearly 18 per cent.

The gradual rise in the increased costs of railway material may be measured by this index number of the Bureau of Railway Economics, taken at intervals from May, 1933, to October, 1937. The increase to April, 1937, was steady and consistent, with a slight recession between April and October, 1937. The index numbers are as follows, for railway materials other than fuel:

May, 1933	100.0
February, 1934	115.8
December, 1935	117.4
October, 1936	120.4
April, 1937	141.9
October, 1937	138.3

Similarly, the average cost of coal to the carriers (excluding direct freight and handling charges) increased from $1.51 per short ton in May, 1933, to $2.07 per ton in the fall of 1937, an increase of 37.1 per cent. Corresponding fuel oil prices increased from 56 cents per barrel in May, 1933, to 97 cents in the fall of 1937, or 73 per cent.

Based on the operations of the year ended June 30, 1937, the increase in material prices since 1933 was equivalent to an increase of $197,000,000 in annual costs, while the increase in coal prices was equal to an increase in annual cost of $53,000,000, and the increase in fuel oil prices was equal to $25,000,000. The total annual increase in cost since 1933, due to increased prices, was thus $275,000,000.

The coal prices included in the foregoing comparison make no allowance for increases effective in December under the so-called Guffey Coal Act. That act granted the National Bituminous Coal Commission authority to set up minimum prices of bituminous coal in various producing areas under the act, and the Commission on November 30 announced minimum prices for railroad fuel in all but one or two of the producing areas. The carriers made an effort to secure postponement of the effective date of these prices, which was set by the Commission as December 16, 1937, pending their reconsideration by the Commission, but this effort was unsuccessful.

It is calculated that the action of the Coal Commission will add at least $20,000,000 annually to the cost of railway fuel. This increase in cost per ton was about 22 cents.

The net result of all these changes in prices since 1933, as reported to the Interstate Commerce Commission in the course of hearings in Ex Parte No. 123, is an increase of more than 40 per cent, all materials and fuel included.

Increased Wage Scales

A most important activity of the railways during 1937 was the series of negotiations conducted by them with various groups of employees, respecting wage rates.

Two groups of employees filed demands for increased scales of pay early in 1937. One was the transportation group, consisting of the train and engine brotherhoods, yard men, and switchmen, who demanded an increase of 20 per cent, while the bulk of the remaining organizations, known as the non-transportation group, filed a demand for 20 cents per hour.

After protracted negotiations with the two groups separately, and after insistent demands from representatives of the National Mediation Board that the matter be handled across the table, both wage demands were settled by mutual agreement. Prior to the negotiations, however, both employee groups took strike votes, and declared themselves prepared to call their men out on strike, if an agreement could not be reached.

Such an eventuality would doubtless have led to the appointment by the President of emergency fact-finding boards under the Railway Labor Act, and would have created a period of great industrial uncertainty and unrest. Neither side wished to contemplate such a contingency, and both sides were willing to compromise their differences, rather than let them go to a battle before an emergency board, or possibly before a board of arbitration.

Accordingly, the carriers settled with the non-transportation forces, effective August 1, 1937, at 5 cents per hour, and with the transportation group, effective October 1, 1937, at 44 cents per day, equivalent to 5.5 cents per hour of eight-hour day.

These increases, based upon the man-hours of the respective groups in 1936, were calculated to produce an annual increase of $130,000,000 in aggregate railway payrolls. The payroll tax on this wage increase, at 2¾ per cent for railroad retirement (payable by the employer), and at the rate of 3 per cent for unemployment compensation (the rate which becomes effective on January 1, 1938) is approximately 7½ million dollars. Thus the total result of these two wage increases, including the payroll taxes which follow the amount of payrolls, was approximately $137,500,000. The increase averaged about seven per cent on the total payroll of the carriers.

Increase in Payroll Taxes

Not only did material prices and wages go up in 1937, but the tax on railways as employers of labor, for social security purposes, also went up.

Under the Social Security Act, railway companies pay a tax on their total payrolls, to finance unemployment compensation payments. This tax first became effective on January 1, 1936, at a rate of one per cent, increased to two per cent on January 1, 1937, and increased again to three per cent on January 1, 1938. This tax amounted to about $18,250,000 in 1936, and about $39,500,000 in 1937.

While the carriers set up tax accruals in 1936 under the railroad retirement tax of 1935, those charges were later credited back, because the act of 1935 levying the tax was declared unconstitutional. The details of that act, and of the subsequent retirement acts of 1937, ap-

pear in a later section of this review. So far as current operations were concerned, no such taxes should have been set up in 1936, so that all the taxes accrued in 1937 under the 1937 act represent an increase over 1936 in retirement taxes.

The 1937 retirement tax act, which became effective on January 1, 1937, levies a tax of 2¾ per cent on payrolls (with certain exceptions) payable by the employer, and a similar tax of 2¾ per cent payable by the employee. This tax represented an added annual tax cost to the railways of about $53,000,000.

So we have an increase in actual payroll taxes, between 1936 and 1937, as follows:

	1937	1936
Unemployment compensation tax ...	$39,500,000	$18,250,000
Railroad retirement tax	53,000,000	.....
Total	$92,500,000	$18,250,000

The total was thus $18,250,000 in 1936 and $92,500,000 in 1937, with another increase of perhaps $19,000,000 in 1938 due to the further increase in the unemployment compensation tax, from two to three per cent.

No industry could long stand the impact of upward cost trends like these increases in material prices, wage rates, and payroll taxes, without being forced to increase the price it charges for its own product. The inevitable result was the movement for a fifteen per cent increase in freight rates, subject to certain exceptions, inaugurated by the railways in November, 1937, which was docketed as Ex Parte No. 123.

Freight Rates

Before considering Ex Parte 123, it is necessary to review the rate situation over the preceding two or three years.

Effective April 18, 1935, the Interstate Commerce Commission authorized specific increases in rates on certain commodities, as the result of proceedings in Ex Parte 115. These temporary increases, which were generally referred to as emergency charges, were reduced to some extent by the Commission on July 1, 1936, and expired by limitation on December 31, 1936. This was despite the fact that the carriers, late in 1936, requested a temporary extension of those charges, during the pendency of consideration by the Commission of the carriers' then proposals to increase the basic tariffs on certain commodities.

These proposals were heard by the Commission during the spring of 1937, in what was known as Ex Parte No. 115, reopened. The proposed increases applied to a specified list of commodities. The railways withdrew a few commodities from the list in the spring of 1937, and filed tariffs on them in March, April, and May, which were permitted by the Commission to become effective without suspension. These adjustments yielded increased revenue estimated at $2,500,000 per year.

In a report dated October 19, 1937, the Commission authorized increases with respect to the bulk of the commodities included in Ex Parte 115, reopened. These commodities were bituminous coal and coke, iron ore, crude petroleum, asphalt, and certain selected manufactures, including refined petroleum, iron and steel products, cement, and the like. The Commission did not authorize increases on anthracite coal, and made several other changes in the carriers' proposals.

The Commission estimated that the increases authorized in the report of October 19 were equivalent to an annual increase in freight revenue of $47,500,000. Tariffs filed under this authorization became effective on November 15, 1937.

The Commission's report of October 19 also dealt with the remaining commodities involved in Ex Parte 115, reopened, the rates on which were not specifically increased by the Commission at that time. The report stated that publication and filing of tariffs on those commodities, carrying increases not in excess of those proposed by the railways, would be permitted, subject to protest and possible suspension for investigation.

The amount of annual freight revenue involved in this last group of commodities has been variously estimated at from $10,000,000 to $15,000,000. Being a somewhat miscellaneous group, and covering a wide variety of movements, it is difficult to make a definite calculation of the amounts involved.

The carriers filed tariffs relating to the second or remaining group of commodities and the rates were permitted to go into effect on December 20, with a few exceptions. The most important exception was a proposed increase of 30 cents per ton on industrial sand, which the Commission suspended, with the notation that such suspension was without prejudice to the filing of a revised tariff carrying an increase of 20 cents per ton, which would be permitted to go into effect on one day's notice.

The annual sum that may be derived from these several increases in freight rates, calculated on the basis of the volume of traffic handled in 1936, amounts to from $60,000,000 to $65,000,000. These totals represent the sum of $2,500,000, $47,500,000 and $10,000,000 to $15,000,000.

So the proceedings under Ex Parte 115, reopened, produced a total addition to freight revenue about one-half as great as the amount lost to the carriers at the end of 1936 by expiration of the emergency charges. That amount was $120,000,000 in 1936. To make up the difference, and to meet the increasing cost of operations so far as might be possible, the railways on November 5 filed an application with the Interstate Commerce Commission for increased rates and fares. This proceeding, designated as Ex Parte No. 123, was also termed the Fifteen Per Cent Case of 1937.

Ex Parte 123

The application requested authority to increase freight rates in the United States, and passenger fares in coaches in Eastern territory. In view of the serious financial position in which the carriers found themselves, at the time, they urged prompt action by the Commission.

The proposed freight increases were 15 per cent on rates and charges with the exception of certain specified maxima on coal and coke, fruits and vegetables, lumber and sugar.

Traffic men calculated that these increases, on the basis of the volume of freight traffic handled during the year 1936, would, had they been in effect during that period, have produced an increase in freight revenue of $437,337,000.

The proposed increase in freight rates and charges did not represent an overall increase of 15 per cent on freight traffic, because of the maxima referred to. It was calculated that the rate increase would, if granted and made effective, average 12.8 per cent throughout the United States, 12.1 per cent in Eastern District, 12.5 per cent in Southern Region and 13.8 per cent in Western District.

Hearings in Ex Parte 123 opened on November 29, and continued from that date to December 14. Proponents of the increase were heard, including the carriers themselves, representatives of shipper interests

who supported the increase, certain intervenors representing security holders, railway supply firms, and the like, and representatives of truck and water lines, who had also intervened in the case.

The carriers filed an extraordinary petition with the Commission on December 9, in which they outlined the serious financial position of the carriers, because of the sudden and heavy decline in traffic and revenues, and requested authority to make the proposed increases effective at once, pending further hearings and final decision by the Commission. While the Commission overruled this petition, at the same time it speeded up the dates of further hearings, in order that final decision might be reached at an early date.

After a series of hearings throughout the United States, beginning on January 6, 1938, final hearings were scheduled for Washington beginning January 17, to be followed at once by the filing of briefs and oral argument, with speedy submission of the case for ultimate action.

The rates proposed by the carriers in this proceeding were designed to be additional to increases derived by them as a result of Ex Parte 115, reopened.

Passenger Fares

Effective June 2, 1936, 2 cents a mile became the maximum legal rate for passenger travel in coaches of the railroads of the United States, and 3 cents per mile in parlor and sleeping cars, by order of the Interstate Commerce Commission.

Some of the carriers in the Southern and Western territories had already reduced their passenger fares to or below these maximum limits. The coach fares in some cases ran as low as one to 1.5 cents per mile, while the rail rates for passengers in sleeping and parlor cars were as low as 2 and 2.5 cents per mile.

As a result of increased costs of operation, the carriers decided in the fall of 1937 to increase the level of their passenger fares, as well as their freight rates.

Accordingly, carriers in the Western District filed certain changes in round-trip fares in coaches, round-trip fares in Pullman cars, special rates to the West Coast and to intermediate points, etc. As all of these changes fell within the maximum fare limits set by the Commission, no application to the Commission for special authority to make the changes was necessary, but only the filing of tariffs, subject to suspension. The tariffs were filed, and by the end of the year a considerable number of them had already gone into effect, while the balance were expected to go into effect shortly after January 1, 1938. No change was made in the standard one-way passenger fare in coaches in the Western District.

In the Southern Region, the carriers decided to add one-half cent per mile to the standard coach fare, increasing it from 1.5 to 2 cents. In addition, they increased the round-trip fare in sleeping and parlor cars from 2 cents to 2¼ cents per mile. These changes were made effective by means of tariffs filed with the Commission, as of November 15, 1937.

In the Eastern District, where the present maximum rail fares of 2 cents in coaches and 3 cents in sleeping and parlor cars were already in effect, it was necessary to request additional authority from the Interstate Commerce Commission, in order to effectuate upward revisions in those rates. Having decided that the standard fare in coaches should be increased to 2.5 cents per mile, carriers in the Eastern District applied for authority to make such an increase. Their application was made a part of the general application in Ex Parte No. 123.

Separate hearings on the passenger fare proposal were held in Washington on December 23 and that subject will be made a part of the decision of the Commission, when rendered.

Shortly after the railways filed their application, the Pullman Company requested authority to increase its own rates in sleeping and parlor cars by 10 per cent. This application was heard in part during the month of December.

Railroad Retirement Legislation

Congress enacted two bills during 1937, which closed the long controversy over a national system of retirement and annuities for railway employees.

The first Railroad Retirement Act, approved in 1934, was declared unconstitutional by the Supreme Court in 1935. Congress enacted two bills in 1935, designed to accomplish the same ends as those contemplated by the 1934 act, and at the same time escape the constitutional infirmities of that act. These bills set up a railroad retirement system, and levied a tax on railway payrolls. The taxing act was found unconstitutional by the District Court of the United States for the District of Columbia, which issued an order enjoining the collection of the tax. However, the Railroad Retirement Board set up under the Retirement Act of 1935 had received appropriations from Congress for administrative expenses and for payment of annuities, and continued to grant annuities to retired employees.

The situation thus created was so confused that steps were taken to clear the legislative and judicial impasse. At the suggestion of the President, railway managements and employees in the spring of 1937 agreed upon a national railroad retirement plan. The terms of this agreement were embodied in two bills, one of which created a Railroad Retirement System, while the other levied payroll taxes designed to supply funds for the system. These bills were enacted by Congress, and were approved in June, 1937. Thus the third Railroad Retirement Act came into being in 1937.

In general, the Railroad Retirement Act of 1937 provides non-compulsory retirement at the age of 65, or at the age of 60 after 30 years of service, and also provides retirement for total permanent disability after 30 years of service.

Annuities are payable up to $120 per month according to years of service and compensation received, not in excess of $300 per month. Minimum annuities are also provided for employees reaching age 65 and with at least 20 years of service.

Death benefits are provided for.

The act further provides for the transfer of the voluntary pension rolls of the railway companies to the Federal Railroad Retirement Board as of July 1, 1937.

The Railroad Retirement Taxing Act of 1937 levied a payroll tax on compensation received by railway employees, up to $300 per month per man, the tax to be paid one-half by the company and one-half by the employee. The total tax is fixed at 5½ per cent from January 1, 1937, and increases one-half of one per cent every three years, reaching a maximum of 7½ per cent on January 1, 1949.

Based upon an estimated payroll of $2,200,000,000 per year for all carriers, the tax is expected to produce $121,000,000 per year for the next three years.

To the end of 1937, about 95,000 applications for annuity had been filed with the Railroad Retirement Board. It was expected that some 10,000 of these

would be found ineligible under either act, leaving about 85,000 to be granted. Of these about 58,000 had been granted up to December 31, 1937, leaving 27,000 still to be acted upon. Incidentally, 5,000 of the 58,000 grants had been terminated by death, as of the end of 1937.

These statistics do not include pensioners taken over from the railways, under the Railroad Retirement Act of 1937. The pensioners transferred from carrier to Board rolls on July 1, 1937, numbered 54,782. This total was reduced by from 3,500 to 4,000, because of deaths occurring between July 1 and December 31, 1937.

Congress during 1937 enacted the so-called signal-inspection act, which directed and authorized the Interstate Commerce Commission to maintain a current inspection of signal devices in use by the railways, and to issue orders regarding their maintenance, operation, repair, replacement, or improvement as deemed necessary. This act became effective in August, 1937, and the Commission, in December, sent out a questionnaire to the carriers, designed to supply a picture of the signal situation, operating rules, and the like.

The Pettengill bill, which contemplates repeal of the long-and-short-haul clause of the Interstate Commerce Act, was passed by the House in 1936, but died in the Senate. It was again enacted by the House during the first session of the present or 75th Congress, in April, and was pending before the Senate Committee on Interstate Commerce at the end of 1937.

A train-limit bill, applying to freight trains and setting an arbitrary limit of 70 cars to the train, was passed by the Senate, without debate, in August, 1937. It was set for hearing before the House Committee on Interstate and Foreign Commerce, on January 11, 1938.

This bill presents so great a threat to progress in the efficiency of railway transportation, that carriers and many shippers prepared to fight it vigorously before the House. The position of the railways briefly stated in an advertisement that appeared in many magazines in December, over the signature of the Association of American Railroads, reading in part as follows:

"What this bill really does is to force the railroads backward—backward in safety—backward in service—backward in efficiency—backward in economy.

What it does is to clamp down and smother the whole spirit of enterprise, invention and progress which are America's hope of better transportation in the years ahead."

The carriers estimated that this train-limit restriction would increase their annual operating costs by at least $100,000,000, would necessitate additional capital expenditures for new locomotives and other facilities of at least $300,000,000, and would undo much of the progress recently made toward operating efficiency.

Bills to regulate water and air carriers, and in particular to bring their rates under the control of the Interstate Commerce Commission, were still pending in Congress at the close of 1937.

In addition to the train-limit bill enacted by Louisiana in 1936, Oklahoma passed a somewhat similar bill in 1937. Enforcement of both of these measures has been enjoined by orders of the appropriate Federal courts. Several states, including Pennsylvania, New York, and Indiana, enacted full crew bills, or amendments to previous acts during 1937.

Motor Carrier Act

The Bureau of Motor Carriers of the Interstate Commerce Commission, organized in 1935 under the Motor Carrier Act of that year, devoted itself in 1937 to hearing applications for certificates and permits under the so-called Grandfather Clause of the Act, and to perfecting a better organization for the administration of the Act.

Because of failure of Congress to supply adequate appropriations for the prosecution of its enforcement work, the Bureau of Motor Carriers has been unable to set up some of the activities contemplated under the Act. The most important field in which little or no work has been done, as yet, is that of accounting and statistics.

However, late in 1937 the Bureau issued a standard preliminary form of accounting and statistics, which it will require common carriers by motor vehicle to fill out and report each year, in so far as they may be in receipt of annual revenues of $100,000 or more. These records will be maintained by the carriers, beginning January 1, 1938, and the first reports will be received by the Commission at the close of that year.

Railway Financing

As of November 30, 1937, the status of railway financing through government agencies and the Railroad Credit Corporation, was as outlined below:

Total loans (RFC and PWA)	$738,100,739
Repaid by railways	224,839,175
Balance, November 30	$513,261,564
Of which there had been sold to the public, at a net profit of $4,702,563	106,497,000
Still held by government	$406,764,564

The carriers repaid a total of $15,579,764 during the first eleven months of 1937, which is included in the total repayment of $224,839,195 to date, as shown above.

New borrowing during 1937 totaled $20,150,000. By executive order, the President in October directed the Reconstruction Finance Corporation to make no further commitments for loans or other advances to railway companies.

The carriers' own Railroad Credit Corporation continued the liquidation of its original loan fund of about $75,000,000. A total of 8 per cent of the fund was distributed to the participants during the year 1936 to November 30, making a total of 76 per cent so distributed to that date.

Receiverships and Trusteeships

At the beginning of 1937, a total of 93 railway companies were in the hands of receivers or trustees, of which 33 were companies of Class I. The operated mileage of the 93 companies totaled 70,062 miles.

Three Class I companies went into trusteeship during 1937. Several small companies went into the hands of the courts, and several came out of receivership, making a net total of 96 companies and 71,386 miles in the hands of the courts at the end of the year.

This mileage, representing 28.1 per cent of the total railway mileage in the United States, is the greatest mileage ever to be in the hands of the courts at any one time, whether measured by number of miles or by proportion of total mileage so situated—not a pleasant picture.

Eleven (14,200 miles) of the 36 railway companies of Class I included in the total of 96 companies are in equity receivership, while the remaining 25 companies (54,977 miles) are in process of reorganization under Section 77 of the Federal Bankruptcy Act.

Although Section 77 was designed to facilitate and expedite reorganization of railroads, proceedings there-

under have proved to be protracted affairs, with many varying interests striving in each instance to secure recognition of their position and desires. In November, 1937, oral arguments were held before the Interstate Commerce Commission in the first two major reorganization cases to reach that stage. These arguments disclosed many differences of opinion as to what Section 77 was intended to accomplish, and it seems likely that the section will eventually be subjected to judicial interpretation.

Late in December, the Interstate Commerce Commission, in an effort to break the stalemate in railroad reorganization proceedings, outlined a plan for hastening the reorganization of companies operated by trustees under Section 77. The plan involves the issuance of an interim memorandum report outlining the Commission's views with respect to the major and controversial factors in a case, such report to serve as a basis for discussion among the various parties in interest and as a guide to the parties in getting together on an acceptable plan.

Public Opinion Toward Railways

Public opinion in 1937 exhibited a more intelligent understanding of railway problems, and a more sympathetic view of them, than for some time. This was indicated by the generally favorable reaction of shippers and the public to the proposed rate and fare increases, by official statements from administration heads, and by comment in the periodical press.

The public relations efforts of the railways, through the Association of American Railroads, through regional organizations, and through individual officers, had an undoubted effect in stimulating this greater awareness on the part of the average man. He appreciates the difficulties surrounding the carriers, and realizes that public interest demands that they be kept solvent and going concerns, under private management and operation.

Principal Operating Factors

The following summary presents the statistical results of railway operation in 1937, and compares those results both with 1936 and with 1930. A somewhat more detailed analysis of the several factors will follow. All the statistics in this and succeeding statements relate to railways of Class I, and all are subject to revision when the audited reports of the carriers become available for 1937.

1. Freight traffic (ton-miles) in 1937 increased 6.7 per cent over 1936, and was 5.6 per cent below 1930.

2. Passenger-traffic (passenger-miles) increased 10.8 per cent over 1936, and was 7.3 per cent below 1930.

3. Operating revenues increased 3.3 per cent over 1936, while operating expenses increased 6.7 per cent.

4. Operating costs, including expenses, taxes, equipment and joint facility rentals, amounted in 1937 to $3,595,000,000, an increase over 1936 of $202,000,000, or 6.2 per cent.

5. Net railway operating income amounted to $590,000,000 in 1937, a decrease of $77,000,000 under 1936, or 11.6 per cent. It was less than in 1930 by $279,000,000.

6. The rate of return in 1937 was 2.30 per cent, compared with 2.59 per cent in 1936.

7. Net income after fixed charges approximated $85,000,000 in 1937, compared with a net income in 1936 of $165,000,000, and a net income of $524,000,000 in 1930.

8. There was an upward trend in these several factors during the first three quarters of the year, but most of them turned sharply downward in the fourth quarter.

9. Unusual strides were made in the levels of operating performance, several factors of which reached new heights in 1937.

10. Average revenue per ton-mile and per passenger-mile continued their downward trend in 1937.

The results for 1937 were far below some of the former levels. To show this in a graphic way, Chart A is presented. For easy comparison, the six factors that appear in the chart are reduced to an index basis, the comparative figures for 1930 being taken in each case as 100.

The chart shows, as to all six factors, that considerable progress will be necessary before the levels of 1930 can again be attained. Total operating revenues in 1937, for example, were only four-fifths as great as in 1930. Net railway operating income was less than 70

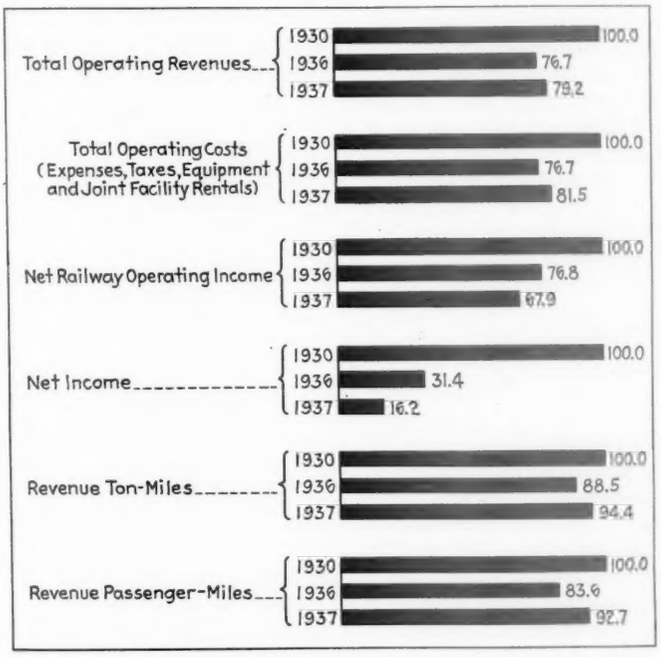


Chart A—Comparative Results For Years 1930, 1936 and 1937 (1930 = 100)

per cent as great in amount as in 1930. Net income after fixed charges was about one-sixth that of 1930.

The chart further exemplifies a significant fact, that the traffic of 1937, expressed in terms of ton-miles, returned almost to the levels of 1930, although revenues did not. Freight traffic was less than 6 per cent below 1930, and passenger traffic less than 8 per cent below, while total revenues were more than 20 per cent below. The explanation of this apparent anomaly lies in the declining revenue per traffic unit, which the carriers were trying at the end of the year (by means of Ex Parte 123) to remedy by an increase in rate levels.

Another significant comparison is that while revenues in 1937 declined about 20 per cent below 1930, the net railway operating income declined more than 30 per cent. This illustrates the effect of the rising tide of operating costs on the railway net.

Traffic in 1937

Revenue carloadings, which began their upward trend in August, 1935, continued almost uninterruptedly throughout the year 1936, and through the first nine months of 1937. As a result, the carriers experienced

their best year in that respect since 1931. Loadings in 1937 represented a gain of 2,037,000 cars, or 5.6 per cent, over those of 1936.

The peak loading of the year occurred during the week of October 2, with 847,245 cars, compared with a peak of 826,525 cars in 1936. Weekly loadings exceeded 800,000 in seven weeks throughout the year, the week of July 3, three of the four weeks in September, and three of the five weeks in October.

Table I summarizes railway freight and passenger traffic in each of the years 1930 to 1937.

Table I—Comparative Traffic Statistics

	Revenue carloadings (Thousands)	Revenue Ton-miles (Millions)	Revenue Passenger-Miles (Millions)
1937	38,100	362,000	24,852
1936	36,063	339,246	22,421
1935	31,504	282,037	18,476
1934	30,846	268,711	18,033
1933	29,220	249,223	16,341
1932	28,180	233,977	16,971
1931	37,151	309,225	21,894
1930	45,878	383,450	26,815

Both carloadings and ton-miles were greater in 1937 than in any of the six years from 1931 to 1936, but both fell below the levels of 1930. Passenger-miles in 1937 were greater than in any of the preceding six years, but were less than in any year from 1906 to 1930.

Carloadings in 1937 showed an increase of 5.6 per cent over 1936, while ton-miles increased 6.7 per cent.

The increase of 10.8 per cent in passenger-miles in 1937 was accompanied by an increase of 7.4 per cent in passenger revenue. This was the fourth successive year in which both passenger revenue and traffic have increased over the preceding period.

Loadings by Commodity Groups

Table II distributes the 38,100,000 cars loaded in 1937 among the eight principal commodity groups. The percentage increase of each group, 1937 over 1936, appears in the second column.

Table II—Distribution of Carloadings

	Number (000)	Per cent increase 1937 over 1936	Per cent distribution 1937	Per cent distribution 1936
Grain and products	1,791	D 0.7	4.7	5.0
Live stock	724	D 4.6	1.9	2.1
Coal	6,972	0.2	18.3	19.3
Coke	533	11.3	1.4	1.3
Forest products	1,867	11.2	4.9	4.7
Ore	2,248	38.8	5.9	4.5
Merchandise, L.C.L.	8,458	2.3	22.2	22.9
Miscellaneous	15,507	6.9	40.7	40.2
Total	38,100	5.6	100.0	100.0

Six of the eight commodity groups increased in 1937, the percentage of increase ranging from a maximum of 38.8 per cent for ore down to a minimum of 0.2 per cent for coal. Ore, forest products, coke, and miscellaneous loadings increased at a greater rate than the overall increase of 5.6 per cent, while the greatest gain in number of cars occurred in loadings of miscellaneous freight.

Financial Results in 1937

Condensed results of operation in 1937, shown in Tables III to VI, are summarized from available monthly reports; the returns for earlier years are drawn from annual reports.

Table III is a brief statement of the consolidated income account of railways of Class I for the years 1937, 1936, and 1930. The year 1930 is included in this and succeeding tables, to supply a more nearly normal basis of comparison than that offered by any intervening year since 1930.

Table III—Income Account

	1937 (millions)	1936 (millions)	1930 (millions)
Total operating revenues	$4,185	$4,053	$5,281
Total operating expenses	3,127	2,931	3,931
Taxes	336	320	349
Net railway operating income	590	667	869
Net income after fixed charges	85	165	524

Revenues, expenses, and taxes all showed increases in 1937, but all were less than in 1930.

Total operating revenues in 1937 increased $132,000,000, or 3.3 per cent, while operating expenses increased $196,000,000, or 6.7 per cent.

The operating ratio stood at 74.4 per cent in 1930, averaged 72.3 per cent in 1936, and increased to 74.7 per cent in 1937. This shows a continuing control of expenses by the carriers, although with rising costs this result will no longer be possible, unless the volume of traffic, or the level of rates, or both, are raised in the near future.

The increase shown for taxes in 1937 is $16,000,000, or 5.1 per cent. As already indicated above, this increase does not tell the real story of the increase in the tax burden from 1936 to 1937. Many companies charged amounts to their tax account in 1936 under the retirement tax act of 1935, and credited the same amounts to the tax account in 1937, thus overstating the 1936 burden and understating the 1937 burden. The real increase in the tax for social security purposes—unemployment compensation and railroad retirement—was from $18,250,000 in 1936 to $92,500,000 in 1937.

Net railway operating income amounted in 1937 to $590,000,000, a decrease of 11.6 per cent under 1936, and less by 32.1 per cent than in 1930.

Net income after fixed charges amounted to $85,000,000 in 1937, compared with $165,000,000 in 1936 and $524,000,000 in 1930.

These figures compare the whole of 1937 with the whole of 1936. They throw no light on the rapidly changing trend of revenues and expenses during 1937. This is shown in Chart B, where the percentage increase or decrease of total operating revenues and total operating expenses is plotted for each month of 1937, compared with the corresponding month of 1936.

Chart B makes it clear that from January to April, revenues increased at a greater rate than expenses. The reverse was true from May on, and the spread between the curves grew gradually greater toward the close of the year. Revenues showed decreases in the last three months, while expenses declined in December because of drastic retrenchments, although no quick retrenchment could possibly offset the sharp drop in revenues.

Operating Revenues

All classes of operating revenue were considerably less in 1937 than in 1930. Freight and passenger reve-

nues, together with "all other" revenue, showed an increase in 1937 over 1936. Table IV compares the principal items of railway revenue in 1937, 1936, and 1930.

Table IV—Operating Revenues

	1937 (millions)	1936 (millions)	1930 (millions)
Freight revenue	$3,396	$3,309	$4,083
Passenger revenue	443	412	730
Mail revenue	96	96	111
Express revenue	58	60	115
All other	192	176	242
Total	$4,185	$4,053	$5,281

Freight revenue, the largest single revenue item, increased 2.6 per cent over 1936, while passenger revenue showed an increase of 7.4 per cent. We have already seen that freight revenue increased during the first nine months, but decreased sharply in the final quarter.

Express revenue, which represents contract payments to Class I carriers from the two railway express companies, showed a slight decrease. The gross charges

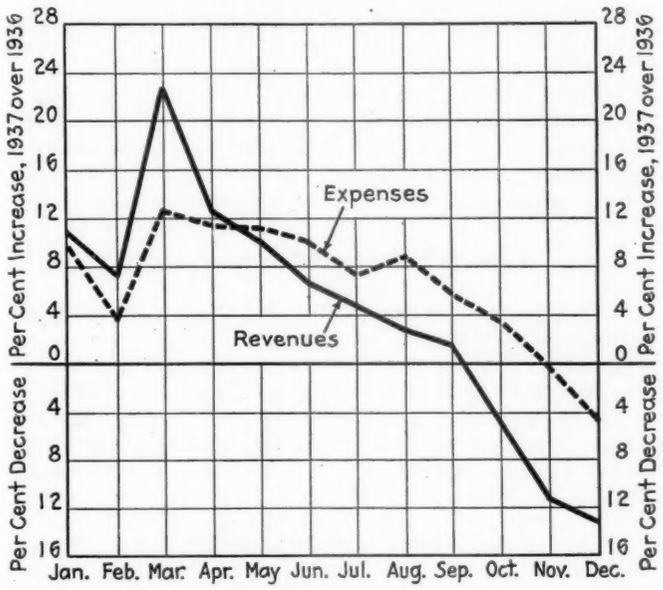


Chart B—Trend of Operating Revenues and Expenses, 1937 Compared to 1936

for express transportation of these two companies showed an increase, from 1936 to 1937, of about four per cent.

Operating Expenses

Every class of operating expense, except "general and other," increased in 1937. Table V compares the principal items of railway operating expenses in 1937, 1936, and 1930. These increases were due in part to increases in material prices and in wage rates; in part to the increased traffic of the year as a whole; and in part to the greater number of employees, when taken as an average throughout the year.

Table V—Operating Expenses

	1937 (millions)	1936 (millions)	1930 (millions)
Maintenance of way	$ 493	$ 455	$ 706
Maintenance of equipment	834	783	1,019
Traffic	105	100	128
Transportation	1,520	1,405	1,848
General and other	175	188	230
Total	$3,127	$2,931	$3,931

Transportation expenses increased $115,000,000, or 8.1 per cent, 1937 over 1936. Maintenance of equipment increased $51,000,000, or 6.5 per cent, while maintenance of way increased $38,000,000, or 8.4 per cent.

The two maintenance accounts combined totaled $1,327,000,000 in 1937, an increase of $89,000,000 over 1936. While this increase was due in part to increased price levels, it was $398,000,000 less than the expenditure for total maintenance in 1930.

Unserviceable locomotives and freight cars declined during the year 1937: as to freight locomotives, from 30.4 per cent during 1936 to an average of 25.5 per cent during the first ten months of 1937; as to passenger locomotives, from 23.3 per cent during 1936 to an average of 20.3 per cent during the first ten months of 1937; as to freight cars, from 12.8 per cent during 1936 to an average of 10.2 per cent during the first ten months of 1937.

Net Railway Operating Income and Rate of Return

The rate of return declined in 1937 to 2.30 per cent on property investment, including cash, material and supplies. Table VI shows for a period of ten years, 1928 to 1937, the total amount of net railway operating income and the rate of return on property investment in each year.

Table VI—Net Railway Operating Income and Rate of Return

	Net Ry. Op. Inc. (000)	Rate of return—Per Cent		Net Ry. Op. Inc. (000)	Rate of return—Per Cent
1937	$590,000	2.30	1932	$ 326,298	1.25
1936	667,347	2.59	1931	525,628	2.00
1935	499,819	1.94	1930	868,879	3.30
1934	462,652	1.79	1929	1,251,698	4.84
1933	474,296	1.83	1928	1,172,864	4.65

The rate of return on property investment in 1937 was 2.30 per cent, compared with 2.59 per cent in 1936 and 3.30 per cent in 1930. The corresponding rate of return in 1937 for each of the three districts was as follows: Eastern District, 2.7 per cent; Southern Region, 2.3 per cent; Western District, 1.8 per cent.

Revenue per Traffic Unit

Further decreases in average revenue per ton-mile and average revenue per passenger-mile occurred in 1937, the general trend of both those averages since 1921 having been almost steadily downward. The decline in revenue per ton-mile in 1937 was accentuated by the cancellation of the emergency freight charges by the Interstate Commerce Commission as of December 31, 1936, which had represented an increase of about 3½ per cent in the freight rate level. The decline in revenue per passenger-mile was caused, in part, by the fact that the orders of the Commission setting maximum passenger fares at two cents per mile in coaches and three cents in sleeping and parlor cars, which were effective in 1936 only from June 2, were in effect throughout the whole of the year 1937. The averages for the years 1921, 1925, and 1930 to 1937, appear in Table VII.

Table VII—Revenues per Ton-mile and Passenger-mile 1921-1937

	Revenue per ton-mile (cents)	Revenue per passenger-mile (cents)
1937	0.937	1.783
1936	0.974	1.838
1935	0.988	1.935
1934	0.978	1.918
1933	0.999	2.013
1932	1.046	2.219
1931	1.051	2.513
1930	1.063	2.717
1925	1.097	2.938
1921	1.275	3.086

Revenue per ton-mile declined, during the fifteen-year period from 1921 to 1937, by 26.5 per cent, while reve-

nue per passenger-mile declined 42.2 per cent during the same period.

Average revenue per passenger-mile was lower in 1937 than in any previous year in railway history.

Capital Expenditures and Purchases

Table VIII shows the amounts spent by railways of Class I for capital improvements, and for the purchase of materials and supplies, for each of the ten years from 1928 to 1937.

Table VIII—Capital Expenditures and Purchases

	Capital expenditures	Purchases of materials and supplies
1937 (estimated)	$ 475,000,000	$ 846,000,000
1936	298,991,000	803,421,000
1935	188,302,000	593,025,000
1934	212,712,000	600,224,000
1933	103,947,000	465,850,000
1932	167,194,000	445,000,000
1931	361,912,000	695,000,000
1930	872,608,000	1,038,500,000
1929	853,721,000	1,329,535,000
1928	676,665,000	1,271,341,000
Total—ten years	$4,211,052,000	$8,087,896,000

Gross capital expenditures for 1937 approximated $475,000,000, while purchases of material and supplies are estimated at $900,000,000. These expenditures represented one phase of the railway industry's increased contribution to the progress of recovery, which was necessarily cut down toward the close of the year.

Locomotive and car installations were greater in number in 1937 than in 1936. The number of steam locomotives and freight cars on order on December 1, 1937, however, showed a decrease under the last day of 1936.

According to the Car Service Division, Association of American Railroads, 401 steam and electric or Diesel-electric locomotives, and 70,168 freight cars, were installed up to December 1, 1937. Freight car statistics include those of railroad-owned private refrigerator companies. These compare with 121 locomotives and 43,941 freight cars installed during the whole of the year 1936.

As of December 1, 1937, 196 steam and electric or Diesel-electric locomotives, and 12,566 freight cars, were on order compared with 304 locomotives and 25,592 freight cars on order on December 31, 1936. Table IX shows the details of these statistics of equipment installations and units on order, in 1930 and in each year from 1933 to 1937.

Table IX—Equipment Installations (Railroad Owned or Controlled Units)

	Installed during year	On order December 31
Steam locomotives (new):		
1937 (11 months, and Dec. 1)	342	156
1936	87	297
1935	40	5
1934	59	7
1933	1	1
1930	782	120
Electric and Diesel locomotives (new):		
1937 (11 months, and Dec. 1)	59	40
1936	34	7
1935	102	3
1934	31	90
Freight cars (new):		
1937 (11 months, and Dec. 1)	70,168	12,566
1936	43,941	25,592
1935	8,903	12,805
1934	24,103	628
1933	1,879	224
1930	76,909	9,821
Passenger cars:		
1937 (9 months, and Oct. 1)	570	256
1936	430	177
1935	458	26
1934	406	182
1933	147	6
1930	1,702	264

The passenger car statistics do not include 11 multiple-unit trains of 63 units installed, nor 3 multiple-unit trains, of 15 units, on order.

The margin of locomotive and car supply over the demand declined, both in 1936 and in 1937. Even so, no serious car shortages occurred during the year 1937.

The number of stored serviceable steam locomotives averaged 2,639 in 1937, compared with 2,612 in 1936, and 3,930 in 1935.

The daily railway freight car surplus averaged 142,000 serviceable cars in 1937, compared with 163,647 in 1936 and 283,431 in 1935. These figures do not include privately owned or special service cars. The freight car surplus, up to the end of November, 1937, ranged from a minimum of 101,630 to a maximum of 218,992 cars.

The proportion of steam locomotives in serviceable condition averaged 84.6 per cent in 1937, 79.7 per cent in 1936, and 77.4 per cent in 1935. The proportion of serviceable freight cars averaged 89.8 per cent in 1937, 87.2 per cent in 1936, and 86.0 per cent in 1935. Thus the relative serviceability of both locomotives and cars increased, on the average, during the year 1937.

Unless otherwise specified, the statistics of operating performance in 1937, such as those in the preceding paragraph and those that follow, relate to the first ten months of 1937 and the whole of the year 1936 with which comparison is made.

Freight Train and Car Movement

Average speed of freight trains between terminals increased slightly in 1937, so that the previous record was surpassed. This average, which is inclusive of all road delays, reached a record of 16.0 miles per hour in 1935, and was raised to a new high level of 16.1 miles in 1937. The increase from 1922 to 1937 was 45.0 per cent. Table X shows the averages for 1922 and 1930, and the trend from 1933 to 1937.

Table X—Average Speed of Freight Trains

	(Miles per hour)
1937	16.1
1936	15.8
1935	16.0
1934	15.9
1933	15.7
1930	13.8
1922	11.1

A freight train maintaining an average speed of 16.1 miles per hour, for a continuous period of 24 hours, would cover a total of 386 miles in the course of a calendar day.

The average movement of freight cars and locomotives was also speeded up during 1937. This average is computed on the basis of "active" equipment, excluding surplus or stored and unserviceable units from the calculations.

On this basis, the average movement per "active" freight car per day, during 1937, was 40.9 miles, compared with 39.7 miles in 1936.

Average movement per "active" freight locomotive was 105.6 miles per day during 1937, compared with 97.6 miles in 1936. Corresponding averages for "active" passenger locomotives were 177.9 miles per day during 1937, compared with 174.5 miles in 1936.

Other Performance Averages

Nearly all the significant factors of operating efficiency showed improvement during the year 1937, and several of them reached higher levels than ever before. In fact, careful survey of the efficiency record as a whole in 1937

leads to the conclusion that rail carriers operated their properties in 1937 with greater efficiency than in any previous year.

Both the average freight train load and the average car load increased in 1937. The average train load was 806 tons during 1937, compared with 773 tons during 1936. Ton-miles per loaded freight car-mile for 1937 averaged 27.1 tons, slightly higher than the corresponding average of 26.8 tons in 1936.

Net ton-miles per freight car per day showed an appreciable increase in 1937. The daily average was 578 ton-miles during 1937, compared with 519 ton-miles during 1936.

Gross and net ton-miles per train-hour again broke all records in 1937. They were as follows, during the past five years.

Table XI—Gross and Net Ton-Miles per Train-Hour

	Gross	Net
1937	30,473	12,833
1936	29,186	12,139
1935	28,674	11,671
1934	28,040	11,225
1933	27,344	10,974

Fuel consumption per 1,000 gross ton-miles in the freight service during 1937 averaged 115 pounds, compared with 119 pounds in 1936, and with 163 pounds in 1922. Fuel consumption per passenger train car-mile averaged 14.9 pounds during 1937, compared with 15.3 pounds during 1936, and 17.9 pounds during the year 1922.

Collection and Delivery Service: Motor Truck Competition

The Eastern railroads instituted free collection and delivery of l.c.l. freight in Official Classification Territory in November, 1936. This marked the culmination of an innovation in merchandise freight service, which started with a few Southeastern railroads in 1931. The year 1937 was the first complete year in which the service was available on a virtually nation-wide basis. It is yet early to objectively appraise the effect on the division of the available merchandise traffic between the railroads and the motor trucks, but it may be observed that—

1. Railroad officials are generally of the opinion that adoption of collection and delivery service has brought some l.c.l. traffic back to the rails.

2. Inroads of motor truck competition on railroad traffic have either been halted, or are nearing the saturation point. This is not due entirely to the collection and delivery service, as the operation of the Motor Carrier Act, plus rapid unionization of labor in the Motor carrier business, and other increases in costs, have made it increasingly difficult for motor carriers and others to undersell the railways.

The downward trend in volume of l.c.l. rail traffic not only was halted in 1936, but a slight upward trend set in, which trend was accelerated in the early months of 1937.

Railway Employees

The railway personnel during 1937 averaged 1,118,000, compared with 1,065,624 employees in 1936, an increase of 4.9 per cent.

Aggregate compensation to employees increased from $1,848,636,000 in 1936 to $1,973,000,000 in 1937, or 6.7 per cent.

Annual earnings per employee averaged $1,764 in 1937, compared with $1,735 in 1936. Hourly compensation per employee averaged 70.6 cents in 1937, compared with 69.1 cents in 1936. The increases in 1937 resulted, in part at least, from the wage increases of August 1 and October 1.

There was a gradual rise in railway employment during the year 1937, up to July, as indicated in the following table, which shows the count as of the middle of each month. The seasonal decline in November and December, however, was greater than that which occurs normally.

Table XII shows the number of employees reported by railways of Class I at the middle of each month in 1937, the entry for December being a preliminary estimate.

Table XII—Number of Employees, by Months, 1937

Month	Number	Month	Number
January	1,075,175	July	1,174,434
February	1,099,088	August	1,162,764
March	1,101,003	September	1,133,003
April	1,131,030	October	1,115,919
May	1,153,713	November	1,060,296
June	1,171,683	December	1,040,000

The sharp decline in railway employment, made necessary by the recession in traffic and revenues during the final quarter of 1937, is clearly outlined in Chart C, which is based on calculations of the Interstate Commerce Commission. The curves on this chart are adjusted for seasonal variations in railway employment.

While the curve of employment in 1936 ran generally upward, the corresponding curve for 1937 was relatively stationary to June, then declined rapidly to the end of the year, falling below the 1936 level in both November and December. The effect of the financial position of the railways on employment is thus emphasized.

Conclusion

Our review of railway operations in 1936 closed with a number of questions as to probable developments in

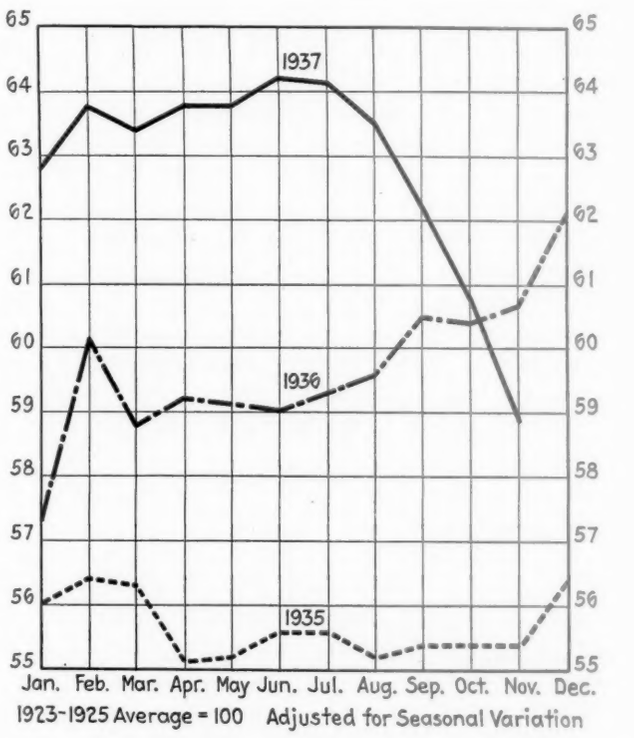


Chart C—Trend of Railway Employment on Class 1 Railways for Years 1935, 1936 and 1937

1937. We may review those questions at this time, and supply the answers, as developed by actual events during that year.

Would traffic and earnings continue to improve in 1937? They did improve, up to September, but showed a sharp downward turn during the last quarter of the year.

Would traffic levels rise sufficiently to offset the loss of revenue from elimination of emergency charges on December 31, 1936? They did until the end of September, but failed to do so thereafter. The emergency charges were only partially restored through the several groups of rate adjustments resulting from Ex Parte 115, reopened.

Would prices continue to rise? They did, until about the middle of the year, then showed a slight reduction. However, the general price level of railway materials was about 15 per cent greater in October, 1937, than in October, 1936, while the average cost of railway coal and fuel oil per unit was considerably higher in the fall of 1937 than during the same period of 1936.

Would Congress enact a six-hour day basis for the calculation of railway wages, and make the process of rail recovery difficult? Congress did not enact the six-hour day in 1937, but did enact a provision for inspection of signal installation, operation, and maintenance, by the Interstate Commerce Commission, which will doubtless lead to additional but not yet disclosed expense to the carriers.

What about the competitive situation in 1937? The general view of railway traffic and operating officials is that the competitive situation is no worse than formerly, and that it has possibly improved. This is due in part to the workings of regulation in the motor carrier and other transportation industries, and in greater part to the rising cost of operation of all transport undertakings. Increased costs will eventually lead, and in part have already led, to the inauguration of increased rates and fares by competing agencies, with the result of a weakening of their competitive position.

What could not be foreseen, at the beginning of 1937, was the sharp recession in commerce and trade, experienced by the people of the United States during the second half of 1937, the extent and duration of which was still uncertain as the year closed.

Looking forward into 1938, railway managements and labor are hopeful that the business recession proves to be that, and not another depression. Even though the freight traffic of the railways in 1938 should run as much as 5 or 6 per cent below that of 1937, it would still be equal to the traffic of 1936. If the decline in 1938 is no greater than that, and if the railways have the additional benefit of favorable action by the Interstate Commerce Commission on their proposal to increase rates and fares, their situation in 1938 will not be so grave as it stood at the close of 1937. These are weighty "ifs," each of which has an important bearing on developments during the coming year.

As always, the future situation will be strongly influenced by the turn of international policy, by legislative and administrative policies at home, and the trend of business activity and of costs. All of these are factors that cannot be forecast with any degree of accuracy, but each one will play its part in the unfolding of the railway history of 1938.

Railways' Past Trend and Present Outlook

(*Continued from page 3*)

less than in 1936; but larger than in any other year since 1930.

Buying of equipment and materials very largely increased in the first quarter of the year, continued to show some increases in the second and third quarters, and finally was much less in the fourth quarter than in 1936. However, the total increased from about $761,000,000 in 1936 to about $846,000,000, or 11 per cent. This was the largest year's buying from manufacturers since 1930, when it was about $876,000,000. The last two years' buying was the largest in any two consecutive years since 1929. In 1930 and 1931 combined it was $1,364,000,000, and in 1936 and 1937 combined it was $1,607,000,000.

Outlook for 1938

The railways' outlook for 1938 is obscure entirely because of uncertainty regarding developments in general business which will determine the volume of freight traffic.

Government policies for five years have restricted investment in almost all large industries. A change of policies that would inspire confidence in future profits among owners of capital and managers of business would cause the largest increase of investment in railroads and other industries, and consequently the greatest expansion of general business and employment, that ever occurred in the history of the United States. President Roosevelt will mainly determine whether this change will occur.

The railways undoubtedly will be given a substantial advance in rates. If the President should assume an attitude as favorable toward large industries from which they derive their traffic as he has recently toward the railroads themselves, the railroads would soon enjoy increases in both their traffic and rates that would be directly very beneficial to them and indirectly even more beneficial to the industries dependent for business on railway purchases.

There are strong indications that the recent decline of general business has reached bottom. A reasonable measure of intelligent co-operation between government, business and labor would soon change its trend from recession to recovery. Let us hope and pray that government, business and labor have all learned from recent dire experience, caused by ignorant and selfish economic policies followed by all of them, and will join forces in 1938 in behalf of the great increase in production of both consumable and durable goods required to revive the trend of business and employment toward recovery and prosperity.

Railways Are Still Being Built in Canada—The C.N.R.'s New Line into Val d'Or, P. Q.

Canadian Roads Have Fair Year

Little progress in dealing with motor competition—Unification still urged—C.N.R. capital accounts revised

By Our Ottawa Correspondent

THE Canadian railways made a fairly creditable performance in 1937, and had the revenue traffic in the last two months been maintained at the level of the first ten months there would have been little cause for complaint. As a great many of the adjustments are made in December it is difficult, if not hazardous, to make a guess on the financial showing of the two principal systems for the year but it is believed probable that the Canadian Pacific will have slightly more than sufficient from its net to deal with its $25,000,000 of interest charges, while the Canadian National will have about $8,000,000 of net to apply to the payment of the $48,000,000 of interest due the public.

Up to December 1 the publicly-owned road was running about 7½ per cent in gross revenue over the corresponding periods of 1936 and the Canadian Pacific's gain was averaging about 5 per cent, but the almost complete crop failure in Western Canada about wiped out any revenue from grain haulage in the last two months of the year. Grain rates charged by the Canadian roads are notoriously low and for that reason an absence of grain traffic for the railways is not a big factor in their year's showings. A large crop obviously means the employment of more hundreds of men by the roads in the prairie provinces and at the Great Lakes and Vancouver terminals and it may give an important picture from the standpoint of gross revenue but it bulks small in net performance, even in good years.

Continued efforts were made by the roads during the year to attract more business and to effect savings in operation. Streamlining has not yet become an obsession in Canada, and up to date this policy has been confined almost entirely to the locomotives. No streamlined trains have yet been built and are not likely to be constructed for a considerable time. A small number of the lighter semi-streamlined trains have been put into service by the Canadian Pacific between Montreal and Quebec and between Calgary and Edmonton, but any outlay on an elaborate service to provide faster schedules will not likely be tried until there is a considerable improvement in traffic prospects.

To Complete Montreal and Vancouver Projects?

At least two of the major capital jobs of the Canadian National, which because of lack of funds to carry to a productive completion have remained expensively uncompleted, are likely to be pressed into service within the coming year. One of these is the Vancouver hotel whose construction was undertaken six or seven years ago because of some agreement between the city and the railway. Its total cost up to date, including interest charges, is estimated at about $20,000,000, and hints have already been given that this big structure in the heart of the Pacific Coast service will be opened for business some time in 1938. It has been virtually completed for three or four years.

There is also the "big hole" in the heart of Montreal. It was dug out of solid rock during the presidency of Sir Henry Thornton as the site for an elaborate terminal and in connection with it was constructed a viaduct across the lower part of the city and connecting the proposed terminal with the Victoria Bridge over the River St. Lawrence. That entire project has up to date

cost the railway and, indirectly, the Dominion treasury $16,509,000. It is computed that the additional expenditure of about $7,000,000 would erect a suitable station in the "hole" and place the viaduct in a usable condition so that the whole terminal plan could be used by the Canadian National. It is expected that during 1938 the completing program will be begun or be provided for so that it can be commenced early in 1939.

Early Legislative Action Unlikely

The general condition of the two roads may be considered hopeful in the face of the steady and serious subtractions from profitable traffic by the highways and by the inescapable load upon the taxpayers to meet charges on the accumulated debt of the Canadian National. Every year there are loud outcries against the failure to provide some adequate solution to the railway problem but at the same time there are some responsible people who insist there is no problem so far as the roads themselves are concerned, no problem, at least, that cannot be softened by the steady, if slow recovery of business and revenue traffic. Legislators seem to be growing philosophical and to be reaching the conclusion that there is little that can be done about it from a legislative standpoint.

The Canadian Pacific with President Sir Edward Beatty as its spokesman still favors some means of linking the two roads together to make joint savings. Previously he favored some form of amalgamation, but his latest address on the general subject, delivered a short time ago at Windsor, contained the declaration that he was not in favor of absorption of the Canadian National by the Canadian Pacific, but rather simply a unification for operating purposes. He went further and said such a move was inevitable, that it would come some day in spite of those who opposed it, and that an annual saving of $75,000.000 could be made by such a move.

Parliament and other transportation and shipping interests did not seem to take the plight of the railways seriously during the 1937 session. Hon. C. D. Howe, Minister of Transport, introduced his famous transport bill in the Senate and it died there, never making its appearance in the House. That measure sought to set up regulation of interprovincial motor traffic, the establishment of some control over water rates on the Great Lakes to end the ruinous rate war, and in general to end the chaos in transportation rates. Mr. Howe said, in addressing the Senate, that "we must either do away with regulation of the railways or apply regulation generally to their competitors."

The bill was opposed by Western grain shippers who feared that the effect of control over water rates would be the establishment of minimum, instead of maximum, rates for the carriage of grain from the head of the Lakes to Montreal. It also was resisted by some of the provincial governments who feared the attempt at controlling highway transport would involve an invasion of provincial rights, while the truck operators opposed it on similar grounds. Even the railways were hesitant about accepting sponsorship of the measure and Mr. Howe denied they were sponsoring it. The steamship companies which had suffered greatly from rate wars were most strongly in its favor, but Arthur Meighen, Conservative leader in the Senate, declared, "It was the most friendless bill I have ever seen come before either house of Parliament." The motion for the bill's third reading was defeated by 30 to 18.

There was a provision of the bill for so-called "agreed charges" such as exist in Britain and these brought bitter criticism from commercial interests in the country. Their case was presented by S. R. Brown, manager of the traffic department of the Canadian Manufacturers' Association, in part, as follows:

"It is still firmly believed that the inclusion of this part in the Bill would be a backward step and open the door to the establishment of agreements, which could not help but place in the hands of large carriers and large shippers an arrangement which would tend to seriously prejudice other carriers and other shippers. We fully appreciate the provisions in the Bill requiring that the agreed charges be approved and giving traders certain rights to make complaints, although denying this right to other classes of carriers than those making the agreements, but nevertheless this part would certainly take away from the users of these services certain conditions of the Railway Act as regards publication, posting and so on, as well as provisions of section 314—discrimination clause—which requires in effect that all tolls shall always, under substantially similar circumstances and conditions, etc., be charged equally to all persons and at the same rate, whether by weight, mileage or otherwise.

"While the information placed before the Committee, attempts to show that a similar provision in the Road and Rail Traffic Act 1935 of Great Britain is working out favorably, it should be pointed out that the information placed before the committee indicates that traders' organizations, such as the Liverpool Chamber of Commerce, were seeking some revisions of the Act, and at page 194 a cable is quoted from the Industrial Transport Association of London, which is an association of shippers' traffic managers, bearing directly on the agreed charges feature and indicates that it is not generally accepted, apparently because it gives the railways a monopoly."

Stormy scenes developed in the House of Commons and in the House committee on railways over the bill of Mr. Howe last session to recast the debt set-up of the Canadian National. Generally speaking about $1,200,000,000 was wiped off the books as money that never would or could be repaid, the argument of its proponents being that it was unfair both to the railway, to the public and even to the financial world to carry indefinitely in the books of the road this load of dead debt. Conservatives, led by former Premier R. B. Bennett, assailed the proposal as an attempt to deceive the public about the real position of the road. After many bitter fights in the committee between Liberals, warmly defending the write-offs, and others who were opposed, the legislation was enacted after certain amendments were made providing that while the write-off could be plainly made there must be carried continuously in the books an appendix showing the nature and extent of the write-off.

Ontario Probes Motor Transport

Improved traffic conditions are expected in the coming year, and it is just possible that as a result of the investigation being conducted in Ontario by a royal commission into the effect of highway traffic upon the steam roads a start may be made to provide some sort of rate regulation of highway carriers. The people would not stand for it last session through the Dominion machinery but it may be started by separate provinces. What has made some people ask pointed questions about the present probe in Ontario by a commission headed by Justice Chevrier, a former member of the Dominion House, is that while it was in its early stages Premier Hepburn of Ontario, possibly because of an impending election, made substantial cuts in the license fees for truck and passenger automobiles.

The New Colonia Hospital Was One of the Major Construction Projects Completed This Year by the National of Mexico

Mexican Railways' Traffic at Peak

Break records in freight and passenger business handled and in gross earnings

THE year 1937 saw new high records established in freight and passenger traffic handled and in gross earnings on the National of Mexico, which comprises some 78 per cent of the total railway mileage in Mexico. The first nine months of 1937 showed an increase of $14,996,258 in income over the same period of 1936, due principally to better freight and passenger business. Expenses also increased, but less rapidly than gross earnings, with the result that net earnings from railway operations increased $3,901,038. These and other figures given are in Mexican dollars, which are quoted currently at about 3.6 Mexican dollars for one U. S. dollar.

Gross earnings of the National lines amounted to $107,541,245 during the first nine months of 1937, as compared with $93,544,987 in the corresponding period of 1936, an increase of 14.96 per cent. Operating expenses rose from $77,106,172 to $87,201,392, or 13.09 per cent, which brought about an increase in net earnings of 23.73 per cent. Contributing to the increases in revenues, freight earnings rose from $65,469,259 to $75,268,833; passenger earnings from $18,349,256 to $21,388,771; express earnings from $7,944,195 to $8,649,735, and miscellaneous earnings from $1,624,115 to $2,086,015. Baggage earnings declined from $132,317 to $125,399, and telegraph earnings from $25,843 to $22,490.

Expenses Increase

The substantial increase in general business resulted in an increase in expenditures for train crews' salaries, fuel, lubricants, etc. During 1937, the railway entered into contracts with its employees, principally with regard to salary increases, which will raise the expenses still further. Those working on an hour, day, or 26-day month basis were awarded a 16 per cent raise, while those on a 30-day basis were granted an 8 per cent increase, which add approximately $9,000,000 a year to the payrolls. Notwithstanding this, expenses did not increase in the same proportion as gross earnings, so that in the first nine months of 1937, 16.54 per cent of the

Table I—Classified Freight Transported, in Tons (Nine Months)

	1937	1936	Inc.	Dec.
Pulque	78,765	81,824	.....	3,059
Rice	47,198	36,610	10,588	.....
Fuel Oil	306,097	276,952	29,145	.....
Cotton	76,671	97,236	.....	20,565
Sugar	173,242	172,573	669	.....
Coffee	37,836	44,255	.....	6,419
Coal	468,710	437,934	30,776	.....
Charcoal	116,085	104,702	11,383	.....
Cement	181,014	132,201	48,813	.....
Beer	92,943	70,934	22,009	.....
Coke	339,236	238,974	100,262	.....
Construction Steel	82,063	43,230	38,833	.....
Fruits	506,442	427,132	79,310	.....
Beans	64,289	70,253	.....	5,964
Gasoline	227,601	191,099	36,502	.....
Cattle	140,371	122,106	18,265	.....
Flour	81,497	84,023	.....	2,526
Lumber	293,467	250,548	42,919	.....
Corn	320,195	361,499	.....	41,304
Lard	20,587	13,969	6,618	.....
Machinery	36,865	59,944	.....	23,079
Bullion	243,772	161,800	81,972	.....
Petroleum	326,408	200,387	126,021	.....
Minerals	1,166,741	900,723	266,018	.....
Wheat	146,057	202,363	.....	56,306
Salt	69,818	55,532	14,286	.....
Liquors and Wines	17,697	23,953	.....	6,256
Miscellaneous	2,935,401	2,320,604	614,797	.....
Totals	8,597,068	7,183,360	1,579,186	165,478

total revenues remained as net earnings, as compared with 11.35 per cent in 1936. Consequently the operating ratio was brought down from 82.43 per cent to 81.09 per cent.

Government Ownership

The event of outstanding importance to the National Railways occurred on June 23, when the government unexpectedly issued a decree expropriating the properties of the National of Mexico, in accordance with the expropriation law passed a year ago, which provides for the indemnification of the owners. Negotiations are under way with the stockholders, and it appears that an understanding has been reached, as regards valuation and the amount to be paid annually to the stockholders on the principal and interest, providing for total annual payments of $11,000,000, of which $9,000,000 is to be applied against interest and $2,000,000 against the debt proper.

Table II—Loaded Cars Interchanged

Gateway	Imports 1936	Imports 1937	Exports 1936	Exports 1937
Laredo	4,585	7,032	3,897	3,816
El Paso	1,285	2,207	1,835	3,082
Eagle Pass	690	1,031	873	904
Brownsville	110	330	827	256
Total	6,670	10,600	7,432	8,058
WATER PORTS				
Tampico	10,309	1,296	1,128	8,322
Vera Cruz	4,984	2,279	2,616	4,538
Manzanillo	5	822	978	33
Total	15,298	4,397	4,722	12,893

The nationalization of the railroads caused dismay among the personnel of the railroad at first, as it was thought that the rail workers would automatically become government employees, and that labor contracts would be disregarded. However, this restlessness disappeared after the commissions appointed by the government and by the union had several meetings and submitted definite propositions and counter proposals.

The union is demanding absolute control of the management from the financial and operating points of view, to which demand the government has presented no objection, providing the union will guarantee to meet the demands of the stockholders and to take over the administration of the Interoceanic and the Nacional de Tehuantepec, which latter lines report a yearly loss of $6,500,000, as well as to expend $9,000,000 a year for additions and betterments. The government also demands the right to supervise the operation of the properties closely, principally with regard to expenditures. Union representatives seem to be willing to accept these conditions, with slight revisions, and the different labor groups are now being asked to express their positions in the matter, looking to the drafting of an agreement with the government by January 1.

Passenger Service

The increase in passenger traffic led to an increase of 4.1 per cent in passenger train kilometers run during the first ten months of 1937, as compared with the corresponding period of 1936. Many mixed trains were converted into straight passenger trains as evidenced by the fact that mixed train kilometers were reduced 1.7 per cent. Local tourist travel has been stimulated by the establishment of special week end rates, and by organizing periodic excursions at attractive rates. International traffic has also shown a material increase, and a special all-Pullman train, with de luxe equipment, now operates weekly between Mexico City and St. Louis.

Freight Traffic Handled

The increase in the volume of freight handled is indicated in Table I. Nineteen commodities show increases totaling 1,579,186 tons, while nine classifications show decreases totaling 165,478 tons, resulting in a net increase of 1,413,708 tons in the first nine months of 1937, as compared with the same period of 1936. The increases in mineral and bullion shipments reflect revived mining activities, while decreases in pulque, liquors and wines show the effects of the government's anti-alcoholic campaign.

Table II shows that the number of loaded cars received in interchange at border points increased 3,930 during the first nine months of 1937, as compared with the corresponding period of 1936, while the export loads increased by 626 cars. Traffic received inbound at ports decreased by 10,901 cars, while exports increased by 8,171 cars. The unfavorable rate of exchange diminished imports and encouraged exports, which explains the change in international trade.

New Equipment

The National railways purchased 8 Mallet locomotives during 1937 of 73,400 lb. tractive power, costing $928,800 (U. S.), and 10 Hudson type locomotives, 41,300 lb. tractive power, costing $862,000 (U. S.), which will be delivered early in 1938. These locomotives are all standard gage. A total of 1,119 box cars was purchased, 325 from the Florida East Coast, and the rest built new.

Table III—Operating Statistics, Ten Months, 1937

	1936	1937	% Inc.	% Dec.
Locomotive kilometers	32,227,566	34,467,638	7.0	..
Passenger train kilometers	9,701,036	10,101,812	4.1	..
Freight train kilometers	12,254,844	13,363,921	9.1	..
Mixed train kilometers	3,538,470	3,478,026	..	1.7
Total train kilometers	25,639,139	27,038,685	5.5	..
Passenger car kilometers	78,019,754	83,244,039	6.7	..
Freight car kilometers	179,606,725	195,807,252	9.0	..
Empty freight car kilometers	82,005,839	89,770,834	9.5	..
Total kilometers—all cars	261,612,564	285,578,086	9.2	..
All cars loaded	395,904	425,273	7.4	..
Net ton kilometers	4,320,107,000	4,880,946,000	13.0	..
Gross ton kilometers	10,240,300,000	11,451,621,000	11.8	..
Car kilometers per car day	51.7	52.7	1.8	..
Freight net ton kilometers per hour	1,091	1,244	14.0	..
Average tons per car	24.05	24.93	3.7	..
Freight train speed (k.p.h.)	23.2	23.1	..	0.4
Kilometers per locomotive day (freight)	179	184	2.8	..
Kilometers per locomotive day (passenger)	234	242	3.4	..

The 250 convertible cars for both narrow and standard gage have already been received, as well as 269 of the standard gage, 100,000-lb. capacity cars.

Most important among the recently completed construction projects is the Colonia Hospital, maintained with company funds exclusively for the benefit of the railway employees, which cost $2,644,587. The building is a thoroughly modern structure with all the necessary equipment, rated as the best hospital in Latin America. Another project involved the consolidation of all passenger traffic other than that of the Inter-Oceanic lines in the Buenavista station. This was made possible by the reconstruction of this station to serve as a temporary structure until the final site for the permanent building can be determined. The new facilities include spacious first and second-class waiting rooms, public corridors

(*Continued on page 57*)

Railway Finances Do a Nose Dive

Security prices tumble when expenses rise as traffic falls—Rate increase needed to prevent further bankruptcies

By J. G. Lyne

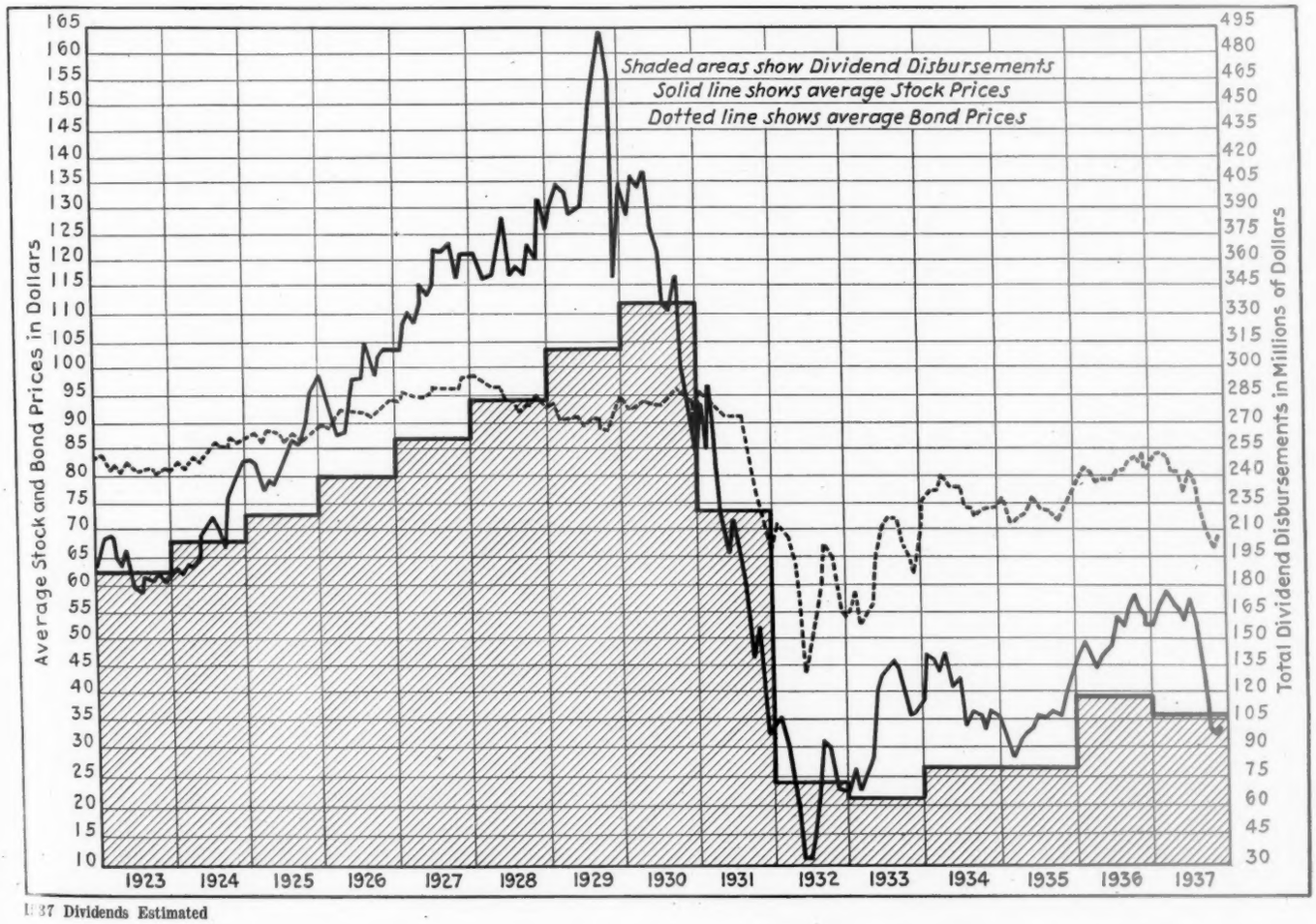
Assistant to the Editor

IF there is any truth in the theory currently expounded in Washington that depressions are engendered by the gloom of the press, perhaps we just ought to skip this review of railway financial trends during 1937. The story can be quickly comprehended by a glance at the chart at the bottom of this page, which shows the *Railway Age* index of prices of representative railway securities. On this chart it will be seen that the average of stock prices is now back to where it stood early in 1935, and that bond prices, according to the index, are lower on the average than they have been at any time since late in 1933.

The year did not begin inauspiciously. There was, to be sure, a sag in security prices over the year-end 1936-37 occasioned by the refusal of the Interstate Commerce Commission to permit the continuance of the "emergency" freight surcharges. As traffic volume continued to show large increases over the previous year, however, earnings prospects improved—and stock and bond prices advanced. By the middle of the year, however, the traffic increase had largely disappeared—and gross revenues (because of the reduction in rates at the beginning of the year) actually began to fall below those of 1936. The earnings outlook was further darkened at this time by the coming to a head of the demands of organized labor for increases in wages. The rate increase case which the railroads presented to the Interstate Commerce Commission early in the year was long drawn out with no decision until October, and the cost of materials and supplies advanced—largely as a result of wage increases forced on business by widespread militant unionism in the first half of the year.

Rate Advance Would Change Outlook

The small rate advance did come through in the fall—but by that time traffic had dropped well below 1936 levels—and its favorable effect on security prices was



1937 Dividends Estimated

Chart A—Average Prices of 20 Representative Stocks and 20 Bonds, with Dividends of 20 Railroads on Same Relative Scale

slight, and short-lived. In December, however, it appeared that the traffic decline had ceased to grow, and the railways were presenting with great vigor and unanimity a rate increase case to the Interstate Commerce Commission, which, if successful, could not fail materially to improve their prospects. Furthermore in its decision in the rate increase case in the fall, the Interstate Commerce Commission stated clearly its views favorable

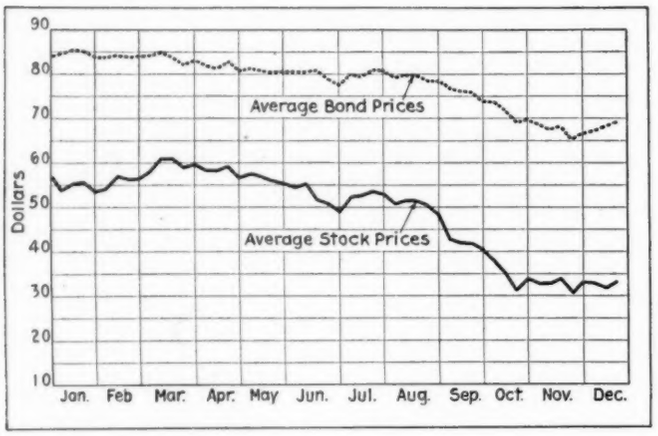


Chart B—Fluctuations in Average Prices of Twenty Leading Railroad Stocks and Twenty Bonds in 1937

toward a rate level sufficient at least to maintain railroad credit. Its statement was so positive that it is unthinkable that some further aid in this direction will not be forthcoming. Hence, as the year ends, it is possible to look forward to 1938 with considerable hope.

Equipment Issues Well Received

Long term financing on a large scale under conditions prevailing in the latter part of the year was, of course, out of the question. There were only two large issues of bonds—both of them early in the year. In the case of equipment trust obligations, however, there was more activity than there has been for several years. Moreover, the market was so eager for these securities that the bulk of them were absorbed without public offering—and the interest rates persisted at unprecedentedly low levels.

This condition did not change as the year drew to a close either—one of the lowest interest rates of the entire year having been achieved on an issue sold under competitive bidding on December 21. The company making this sale was the Santa Fe, and the interest cost of the money was between 1.94 and 1.95 per cent, the successful bidders being Evans Stillman & Co., who state that this is the lowest cost ever achieved for this type of security in their 24 years' experience in handling such issues. In July the Burlington attained a then record low cost of 1.96 per cent.

Even bankrupt carriers found little difficulty in disposing of equipment obligations at interest rates which, while considerably higher than those paid by solvent companies, nevertheless were lower even than the sound-

Comparison of Dividends and Taxes, 1911 to 1936

Year Ended June 30	Dividends*	Proportion of Net Income Paid in Dividends	Taxes*
1911	$397,068,724	81	$98,626,848
1912	339,964,855	85	109,445,407
1913	322,300,406	66	118,386,859
1914	376,098,785	108	135,572,579
1915	259,809,520	82	133,276,330
1916	281,936,371	47	145,517,034
Year Ended December 31			
1916	306,176,937	47	157,113,372
1917	320,395,779	53	213,920,095
1918	275,336,547	71	223,175,379
1919	278,516,908	63	232,601,396
1920	271,731,669	63	272,061,453
1921	298,511,328	95	275,875,990
1922	271,573,751	73	301,034,923
1923	296,127,048	53	331,915,459
1924	320,429,767	57	340,336,686
1925	342,020,885	49	358,516,046
1926	399,243,963	49	388,922,856
1927	411,581,093	61	376,110,250
1928	430,677,138	55	389,432,415
1929	490,125,673	55	396,682,634
1930	497,024,912	95	348,553,953
1931	330,150,873	245	303,528,099
1932	92,354,322	def.	275,135,399
1933	95,725,783	def.	249,623,190
1934	133,418,896	def.	239,624,802
1935	126,282,306	1675	236,944,985
1936	169,829,290	103	319,752,721

* Not including switching and terminal companies.

Status of R.F.C. Loans on November 30, 1937

	Disbursed	Repaid
Aberdeen & Rockfish	$127,000.00	$127,000.00
Alabama, Tennessee & Northern	275,000.00	.....
Alton	2,500,000.00	605,367.13
Ann Arbor (Receivers)	634,757.00	434,757.00
Ashley, Drew & Northern	400,000.00	400,000.00
Baltimore & Ohio	87,110,399.59	12,150,476.59
Birmingham & Southeastern	41,300.00	41,300.00
Boston & Maine	7,569,437.00	.....
Buffalo, Union-Carolina	.....	.....
Carlton & Coast	535,800.24	123,631.97
Central of Georgia	3,124,319.00	220,691.50
Central of New Jersey	464,298.94	464,298.94
Charles City Western	140,000.00	32,000.00
Chicago & Eastern Illinois	5,916,500.00	155,632.18
Chicago & North Western	46,588,133.00	4,338,000.00
Chicago Great Western	1,289,000.00	838.00
Chicago Great Western (Receivers)	150,000.00	16,000.00
Chicago, Milwaukee, St. Paul & Pacific	11,500,000.00	537.50
Chicago, Milwaukee, St. Paul & Pacific (Receiver)	3,840,000.00	597,000.00
Chicago, North Shore & Milwaukee	1,150,000.00	.....
Chicago, Rock Island & Pacific	13,718,700.00	.....
Cincinnati Union Terminal	8,300,000.00	8,300,000.00
Colorado & Southern	28,925,300.00	1,481,000.00
Columbus & Greenville	.....	.....
Copper Range	53,500.00	53,500.00
Denver & Rio Grande Western	8,081,000.00	500,000.00
Denver & Salt Lake Western	3,182,150.00	71,300.00
Erie	16,582,000.00	582,000.00
Eureka-Nevada	.....	.....
Florida East Coast (Receivers)	627,075.00	320,000.00
Fort Smith & Western (Receivers)	227,434.00	.....
Fort Worth & Denver City	8,176,000.00	.....
Fredericksburg & Northern	.....	.....
Gainesville Midland (Receivers)	.....	.....
Gainesville Midland	.....	.....
Galveston, Houston & Henderson	1,061,000.00	.....
Georgia & Florida (Receivers)	354,721.00	.....
Great Northern	6,000,000.00	6,000,000.00
Green County	13,915.00	13,915.00
Gulf, Mobile & Northern	520,000.00	520,000.00
Illinois Central	35,290,000.00	105,000.00
Lehigh Valley	8,500,000.00	8,500,000.00
Litchfield & Madison	800,000.00	800,000.00
Maine Central	2,550,000.00	2,550,000.00
Maryland & Pennsylvania	197,000.00	50,000.00
Meridian & Bigbee River (Trustee)	985,000.00	.....
Minneapolis, St. Paul & Sault Ste. Marie	6,843,082.00	656,367.74
Mississippi Export	100,000.00	62,500.00
Missouri-Kansas-Texas	2,300,000.00	2,300,000.00
Missouri Pacific	23,134,800.00	.....
Missouri Southern	99,200.00	200.00
Mobile & Ohio	785,000.00	785,000.00
Mobile & Ohio (Receivers)	1,070,599.00	570,599.00
Murfreesboro-Nashville	25,000.00	.....
New York Central	27,499,000.00	27,499,000.00
New York, Chicago & St. Louis	18,200,000.00	18,200,000.00
New York, New Haven & Hartford	7,699,778.34	175,102.07
Pennsylvania	28,900,000.00	28,900,000.00
Pere Marquette	3,000,000.00	3,000,000.00
Pioneer & Fayette	17,000.00	10,500.00
Pittsburgh & West Virginia	4,475,207.00	750,000.00
Puget Sound & Cascade	300,000.00	300,000.00
St. Louis-San Francisco	7,995,175.00	2,805,175.00
St. Louis-Southwestern	18,672,250.00	18,672,250.00
Salt Lake & Utah (Receivers)	200,000.00	.....
Sand Springs	162,600.00	162,600.00
Southern Pacific	22,000,000.00	22,000,000.00
Southern	19,610,000.00	2,257,460.00
Sumpter Valley	100,000.00	100,000.00
Tennessee Central	5,147,700.00	147,700.00
Texas, Oklahoma & Eastern	.....	.....
Texas & Pacific	700,000.00	700,000.00
Texas South-Eastern	30,000.00	30,000.00
Tuckerton	39,000.00	39,000.00
Wabash (Receivers)	15,731,583.00	.....
Western Pacific	4,366,000.00	1,403,000.00
Wichita Falls & Southern	400,000.00	100,000.00
Wrightsville & Tennille	22,525.00	22,525.00
Totals	$537,126,239.11	$181,203,224.62

est companies have had to pay for equipment money in times past.

Only a mere handful of the railroads are paying dividends, even on their preferred issues—and there were no large-scale changes during the year in the dividend status of most companies. Quite likely the aggregate of dividends paid may prove to have exceeded that of 1936. (This is not indicated by the chart on the first

Major Issues of Bonds Sold in 1937

Issue	Maturity	Amount	Int. Rate %	Sold to Banker Price	Sold to Banker Cost	Offered to Public Price	Offered to Public Cost	
Canadian National, guar.	1944	$15,500,000	2¼	.....	...	99.125	...	.....
Canadian National, guar.	1952	20,000,000	3	.....	...	99.5	...	.....
Chicago, Burlington & Quincy, coll. trst. notes..	1937-46	7,000,000	2¼	.....	2.32	.....	...	Prudential Ins. Co.
Denver & Rio Grande Western, ser. C	1937	1,800,000	1⅛	Par[1]	...	.....	0.80	Stone & Webster and Blodgett, et. al.
Denver & Rio Grande Western, ser. D	1939	3,200,000	2⅛	Par[1]	...	.....	...	.....
Great Northern, gen. mtg.	1967	50,000,000	3¾	95¼	...	97½	3.89	Morgan, Stanley & Co., et. al.
Indianapolis Union, ref. & imp. mtg., B	1986	3,150,000	3½	98.078	3.58	99	...	Halsey, Stuart & Co., et. al.
Kansas Oklahoma & Gulf, 1st mtg.	1978	297,000	5	.....	...	104¾	4.72	Stroud & Co.
Pennsylvania, conv. deb.	1952	52,670,000	3¼	(2)	3.36	.....	...	Kuhn, Loeb & Co.
Toledo, Peoria & Western, 1st mtg.	1967	1,600,000	4	99.5	...	102	...	W. E. Hutton & Co.
Union Terminal, 1st mtg.	1967	5,000,000	3¾	106.15	3.42	108.15	...	Lazard Freres & Co., et. al.

[1] Premium of $265 paid by banker for all of both issues.
[2] Issue offered to stockholders. Underwriter's fee 1¼ per cent on entire issue plus ¾ per cent on all notes not taken by stockholders.

Principal Equipment Trust Issues Sold in 1937

Road	Maturity	Amount	Int. Rate %	Sold to Banker Price	Sold to Banker Cost	Offered to Public to Yield %	Purchaser
Alabama Great Southern	1938-52	$3,825,000	2¾	97.628	3.1	....	Salomon Bros. & Hutzler, et al.
Atchison, Topeka & Santa Fe	1938-47	3,900,000	2¼	101.57+	....	....	Evans, Stillman & Co.
Atchison, Topeka & Santa Fe	1938-52	13,800,000	2¼	100.353	2.2	....	Prudential Ins. Co.
Atlantic Coast Line	1938-52	3,900,000	2¾	97.02	3.21	....	Brown, Harriman & Co.
Baltimore & Ohio	1938-47	7,500,000	2½	96.788	3.155	....	Salomon Bros. & Hutzler, et al.
Bessemer & Lake Erie	1938-47	6,700,000	2¼	99.789	2.31	0.75-2.50	Salomon Bros. & Hutzler, et al.
Cambria & Indiana	1938-47	1,300,000	2¾	101.033	2.55	....	Salomon Bros. & Hutzler, et al.
Central of Georgia	1938-47	1,400,000	4	102.444	3.63	....	Salomon Bros. & Hutzler, et al.
Chesapeake & Ohio	1938-47	4,000,000	2	99.07+	2.168	0.75-2.40	F. S. Mosely & Co., et al.
Chicago & North Western	1938-47	4,460,000	2½	95.373	3.43	....	Salomon Bros. & Hutzler, et al.
Chicago, Burlington & Quincy	1938-47	3,650,000	2½	100.277	2.445	....	Salomon Bros. & Hutzler, et al.
Chicago Great Western	1937-47	1,500,000	3½	100.135	3.47	....	Salomon Bros. & Hutzler, et al.
Chicago, Milwaukee, St. Paul & Pacific	1938-52	1,920,000	3¾	102.444	3.39	....	Salomon Bros. & Hutzler, et al.
Chicago, Milwaukee, St. Paul & Pacific	1938-52	2,655,000	3¼	100.06+	3.241	....	N. W. Mut. Life Ins. Co.
Chicago, Rock Island & Pacific	1937-47	2,400,000	3½	100.539	3.38	....	Lehman Bros., et al.
Cincinnati, New Orleans & Texas Pacific	1938-52	6,810,000	2½	96.678	2.98	....	Salomon Bros. & Hutzler, et al.
Clinchfield, Ser. A	1938-52	1,815,000	2¼	97.777	2.6	0.75-2.85	Salomon Bros. & Hutzler, et al.
Denver & Rio Grande Western	1938-52	2,175,000	3¼	97.46+	3.619	....	Freeman & Co.
Detroit, Toledo & Ironton	1938-47	2,000,000	2¾	98.29+	3.1	....	Salomon Bros. & Hutzler, et al.
Duluth, Missabe & Northern	1938-52	3,780,000	2½	101.056	2.36	....	Prudential Ins. Co.
Elgin, Joliet & Eastern	1938-52	2,250,000	2½	100.702	2.41+	....	Prudential Ins. Co.
Great Northern, Ser. E	1938-47	4,650,000	2	98.597	2.3	....	Evans, Stillman & Co.
Illinois Central, Ser. R	1937-52	7,050,000	3	98.277	3.26	0.75-3.45	First Boston Corp., et al.
Kansas City Southern, Ser. F	1938-52	3,195,000	3	105.08+	....	....	Brown, Harriman & Co.[1]
Lehigh & New England, Ser. K	1938-47	250,000	3	102.962	2.4	....	E. H. Rollins & Sons
Louisiana & Arkansas, Ser. A	1937-47	400,000	3	99.935	3.01	....	} Comml. Nat. Bank
Louisiana & Arkansas, Ser. B	1938-47	75,000	3	98.304	3.35	....	} Shreveport
Louisville & Nashville	1938-52	4,950,000	2¼	98.53	2.484	....	Wood, Struthers & Co.
Missouri-Kansas-Texas	1938-52	3,750,000	2½	98.827	2.68	0.875-2.95	Evans, Stillman & Co., et al.
Missouri Pacific, Ser. BB	1938-52	4,260,000	3½	100.15+	3.48	....	Freeman & Co.
Montour	1938-47	700,000	2½	101.29	2.25	....	Prudential Ins. Co.
Nashville, Chattanooga & St. Louis, Ser. C	1938-52	840,000	2¼	96.399	2.764	0.90-3.00	Salomon Bros. & Hutzler, et al.
New York Central	1938-52	4,290,000	2¼	96.04	2.82	0.90-3.20	Evans, Stillman & Co., et al.
New York, Chicago & St. Louis	1938-47	2,330,000	2¼	98.391	2.57	....	Salomon Bros. & Hutzler, et al.
New York, New Haven & Hartford	1938-47	1,660,000	3	98.517	3.304	....	Salomon Bros. & Hutzler, et al.
Northern Pacific	1938-47	6,490,000	2¾	100.64+	2.62	1.10-2.90	Salomon Bros. & Hutzler, et al.
Pennsylvania, Ser. H	1938-52	7,740,000	2¾	98.379	2.99	1.10-3.15	Brown, Harriman & Co., et al.
Pere Marquette	1938-47	1,940,000	2¾	97.531	3.198	1.30-3.40	Brown, Harriman & Co., et al.
Pittsburgh & West Virginia	1938-47	260,000	2¼	94.77	3.4	....	A. G. Becker & Co.
Seaboard Air Line, Ser. FF	1937-47	2,500,000	3½	97.72	4.	....	Prudential Ins. Co.
Southern Pacific	1938-52	11,220,000	2¼	97.377	2.66	....	Salomon Bros. & Hutzler, et al.
Spokane, Portland & Seattle	1938-47	1,200,000	2¾	102.222	2.3	....	Paine, Webber & Co., et al.
Texas & Pacific, Ser. D	1938-52	1,275,000	2¾	100.434	2.703	0.85-3.00	F. S. Moseley & Co.
Union	1938-51	2,380,000	2½	99.416	2.61	....	1st Natl. Bank of Pgh., et al.
Union Pacific, Ser. E	1938-52	10,410,000	2¾	101.133	2.588	0.80-2.81	Salomon Bros. & Hutzler, et al.
Western Pacific	1938-52	2,320,000	3	100.34+	2.97	....	Prudential Ins. Co.
Wisconsin Central	1937-47	1,200,000	3½	Par[2]	3.497	....	1st Natl. Bank of Mpls.

[1] Purchased $1,278,000 of the issue.
[2] Plus premium of $200 for the entire issue.

Railway Securities Sold to Public in 1916 and 1920 to 1937

Year	Bonds	Notes	Stock	Total R.R. financing	Total all financing	Per Cent R.R. to total
1916	$229,000,000	$126,000,000	$16,000,000	$371,000,000	$1,864,000,000	19.9
1920	194,583,000	193,840,000	3,737,000	392,160,000	3,324,922,000	12.1
1921	455,125,000	202,928,300	27,222,500	685,275,800	2,780,874,000	24.6
1922	299,025,800	288,936,500	27,068,100	615,030,400	3,200,176,000	19.2
1923	165,956,000	354,720,500	59,140,850	579,817,350	3,602,704,000	16.0
1924	620,347,000	351,276,200	11,000,000	982,623,200	4,185,590,000	23.5
1925	374,020,500	151,753,740	30,934,430	556,708,670	5,234,992,000	10.6
1926	241,954,000	172,477,000	41,577,200	456,008,200	5,746,354,000	7.9
1927	686,939,500	89,184,600	210,596,900	986,721,000	7,830,641,000	12.6
1928	525,719,000	79,911,000	187,369,100	792,999,100	8,473,880,000	9.4
1929	418,984,000	180,322,000	275,269,240	874,575,240	11,007,170,000	7.9
1930	800,694,000	142,168,000	63,805,600	1,006,667,600	5,920,498,000	17.0
1931	453,824,000	105,209,000	.....	559,033,000	2,730,082,000	20.5
1932	11,827,000	13,125,000	.....	24,952,000	684,806,000	3.6
1933	12,000,000	.....	.....	12,000,000	335,812,000	3.6
1934	172,074,000	71,068,000	.....	243,142,000	618,627,000	39.3
1935	107,746,000	57,372,000	.....	165,118,000	2,190,093,550	7.6
1936	592,254,000	77,580,000	.....	669,834,000	4,061,901,025	16.5
1937*	60,547,000	95,820,000	.....	156,367,000	1,557,855,702	10.0

* 11 Months Total as compiled by Dow Jones & Co.

page of this article, which shows a decline in dividend payments in 1937 on the stocks of companies which are included in the *Railway Age* index of stock prices. However, on this chart the 1936 total was boosted somewhat by the inclusion in that year of a stock dividend by one of the companies, which did not recur in 1937.)

Dividend Changes

Some of the more noteworthy changes in dividend status which occurred during the year are noted in the following:

The Alabama Great Southern in November declared extra

Trusteeships Established in 1937

Name of Road	Mileage	Funded Debt Outstanding	Capital Stock Outstanding
Duluth, South Shore & Atlantic...	549	$23,000,000	$22,000,000
Mineral Range	44	1,598,675	1,500,000
Missouri Pacific:[a]			
Asphalt Belt	18	None	20,000
Cairo & Thebes	...	1,699,000	10,000
Chester & Mount Vernon.....	...	250,000	250,000
Fort Smith Suburban	...	None	46,600
Marion & Eastern	...	None	50,000
Natchez & Southern	3	None	250,000
New Orleans, Texas & Mexico:[a]			
Asherton & Gulf	32	200,000	75,000
Houston & Brazos Valley.....	43	1,000,000	422,000
International-Great Northern:[a]			
Austin Dam & Suburban...	...	None	100,000
New Iberia & Northern.....	113	2,000,000	1,000,000
Iberia, St. Mary & Eastern	...	1,000,000	5,000
Orange & Northwestern.....	62	1,066,947	35,000
San Antonio Southern.....	45	None	250,000
San Benito & Rio Grande Valley	128	953,735	70,000
Sugar Land	53	384,000	250,000
Rio Grande City	21	None	22,000
New York, New Haven & Hartford:[a]			
Providence, Warren & Bristol..	...	None	874,600
New York, Ontario & Western...	577	28,780,000	58,116,983
New York, Susquehanna & Western	143	12,545,908[b]	25,781,163
Wilkes-Barre & Eastern[c].....	83	.....	.....
Oregon, Pacific & Eastern.....	23	330,000	200,250
Total 23 companies	1,937	$74,808,265	$111,328,596

[a] Name inserted to show corporate relationship.
[b] Includes $4,305,640 funded debt matured unpaid.
[c] Controlled by N.Y.S.&W. through ownership of all of its capital stock.

Foreclosure Sales in 1937

Name of Road	Mileage	Funded Debt Outstanding	Capital Stock Outstanding
Jacksonville & Havana*	60	$ 300,000	$ 160,810
Sierra Railway Company of California	119	1,747,000	3,248,000
Total two companies	179	$2,047,000	$3,408,810

* Operations discontinued on October 9.

Mileage in the Hands of Receivers or Trustees

(Figures to 1936, Inclusive, from I. C. C. Statistics for Year Ended December 31, 1936. Figures for 1937 Compiled by *Railway Age*.)

Year ended	Miles of road operated by receivers or trustees at close of year	Net change during year in miles of road operated	No. of roads in charge of receivers or trustees at close of year
June 30, 1894.....	40,819	.....	192
1895.....	37,856	−2,963	169
1896.....	30,475	−7,380	151
1897.....	18,862	−11,614	128
1898.....	12,745	−6,117	94
1899.....	9,853	−2,892	71
1900.....	4,178	−5,675	52
1901.....	2,497	−1,681	45
1902.....	1,475	−1,022	27
1903.....	1,185	−290	27
1904.....	1,323	+138	28
1905.....	796	−527	26
1906.....	3,971	+3,176	34
1907.....	3,926	−45	29
1908.....	9,529	+5,603	52
1909.....	10,530	+1,001	44
1910.....	5,257	−5,273	39
1911.....	4,593	−664	39
1912.....	9,786	+5,193	44
1913.....	16,286	+6,500	49
1914.....	18,608	+2,322	68
1915.....	30,223	+11,615	85
1916.....	37,353	+7,130	94
Dec. 31, 1916.....	34,804	−2,550*	80
1917.....	17,376	−17,428	82
1918.....	19,208	+1,832	74
1919.....	16,590	−2,618	65
1920.....	16,290	−300	61
1921.....	13,512	−2,778	68
1922.....	15,259	+1,747	64
1923.....	12,623	−2,636	64
1924.....	8,105	−4,518	61
1925.....	18,687	+10,582	53
1926.....	17,632	−1,055	45
1927.....	16,752	−880	40
1928.....	5,256	−11,496	33
1929.....	5,703	+447	29
1930.....	9,486	+3,783	30
1931.....	12,970	+3,484	45
1932.....	22,545	+9,575	55
1933.....	41,698	+19,153	78
1934.....	42,168	+470	80
1935.....	68,345	+26,177	87
1936.....	69,712	+1,367	91
1937.....	72,009	+2,297	105

* Represents decrease for six months.

Summary of Railroad Receiverships or Trusteeships and Foreclosure Sales, 1876 to 1937

Year	Roads Placed in Receivership or Trusteeship: Number of roads	Miles	Bonds and stocks	Summary of Foreclosure Sales: Number of roads	Miles	Bonds and stocks
1876...	42	6,662	$467,000,000	30	3,840	$217,848,000
1877...	38	3,637	220,294,000	54	3,875	198,984,000
1878...	27	2,320	92,385,000	48	3,906	311,631,000
1879...	12	1,102	39,367,000	65	4,909	243,288,000
1880...	13	885	140,265,000	31	3,775	263,882,000
1881...	5	110	3,742,000	29	2,617	137,923,000
1882...	12	912	39,074,000	16	867	65,426,000
1883...	11	1,990	108,470,000	18	1,354	47,100,000
1884...	37	11,038	714,755,000	15	710	23,504,000
1885...	44	8,836	385,460,000	22	3,156	278,394,000
1886...	13	1,799	70,346,000	45	7,687	374,109,000
1887...	9	1,046	90,318,000	31	5,478	328,181,000
1888...	22	3,270	186,814,000	19	1,596	64,555,000
1889...	22	3,803	99,664,000	25	2,930	137,815,000
1890...	26	2,963	105,007,000	29	3,825	182,495,000
1891...	26	2,159	84,479,000	21	3,223	169,069,000
1892...	36	10,508	357,692,000	28	1,922	95,898,000
1893...	74	29,340	1,781,046,000	25	1,613	79,924,000
1894...	38	7,025	395,791,000	42	5,643	318,999,000
1895...	31	4,089	369,075,000	52	12,831	761,791,000
1896...	34	5,441	275,597,000	58	13,730	1,150,377,000
1897...	18	1,537	92,909,000	42	6,675	517,680,000
1898...	18	2,069	138,701,000	47	6,054	252,910,000
1899...	10	1,019	52,285,000	32	4,294	267,534,000
1900...	16	1,165	78,234,000	24	3,477	190,374,000
1901...	4	73	1,627,000	17	1,139	85,808,000
1902...	5	278	5,835,000	20	693	39,788,000
1903...	9	229	18,823,000	13	555	15,885,000
1904...	8	744	36,069,000	13	524	28,266,000
1905...	10	3,593	176,321,000	6	679	20,307,000
1906...	6	204	$55,042,000	8	262	$10,400,000
1907...	7	317	13,585,000	6	114	13,777,000
1908...	24	8,009	596,359,000	3	138	2,547,000
1909...	5	859	78,095,000	12	2,629	250,033,000
1910...	7	735	51,427,500	17	1,100	93,660,109
1911...	5	2,606	210,606,882	13	1,386	40,741,543
1912...	13	3,784	182,112,497	12	661	25,910,990
1913...	17	9,020	477,780,820	6	1,159	86,163,850
1914...	22	4,222	199,571,446	9	1,470	83,189,500
1915...	12	20,143	1,070,808,628	11	3,914	285,258,782
1916...	9	4,439	208,159,689	26	8,355	703,444,855
1917...	19	2,486	61,169,962	20	10,963	557,846,348
1918...	8	3,519	242,090,800	11	763	24,735,187
1919...	7	244	11,886,779	8	459	15,479,587
1920...	10	541	21,620,150	7	380	7,676,200
1921...	14	1,744	63,872,113	11	4,173	306,123,942
1922...	12	4,330	329,114,860	15	6,151	299,491,646
1923...	10	2,218	87,913,581	8	637	14,622,900
1924...	11	920	30,223,372	14	3,992	269,251,082
1925...	6	11,368	680,422,080	6	638	9,965,000
1926...	6	88	2,821,400	12	12,852	626,662,708
1927...	6	924	45,236,674	5	142	4,254,000
1928...	1	19	529,000	4	209	6,393,250
1929...	3	634	30,981,391	5	562	20,715,065
1930...	4	4,752	277,323,994	2	1,048	124,668,500
1931...	19	5,195	432,151,526	2	102	993,860
1932...	13	11,817	626,577,314	8	394	8,575,178
1933...	18	21,222	1,229,678,183	2	298	16,133,000
1934	1	81	460,000	2	40	1,598,600
1935...	16	29,018	2,182,979,167	5	436	9,146,800
1936...	4	8	43,026,400	3	122	7,507,961
1937...	23	1,937	186,136,861	2	179	5,455,819

Railroads in the Hands of Receivers or Trustees on December 31, 1937

(For explanation of data bearing symbols see column headed "Remarks")

Road	Mileage operated	Mileage owned	Date of receivership or trusteeship	Funded debt outstanding	Capital stock outstanding	Total old company securities	Remarks
Akron, Canton & Youngstown	171	19	Apr. 3, 1933	$3,550,000	$1,500,000	$5,408,000	
Northern Ohio	....	152	Apr. 3, 1933	3,300,000*	4,230,000	7,530,000	*Includes $800,000 General Mortgage bonds held by Akron, Canton & Youngstown.
Alabama & Western Florida	38	19	Nov. 28, 1936	None	153,200	158,700	
Alabama, Tennessee & Northern	218	215	Dec. 14, 1934	3,632,289	3,916,560	7,700,349	
California & Oregon Coast	15	15	Feb. 19, 1925	528,199	350,000	903,199	
Central of Georgia	1927	1459*	Dec. 19, 1932	53,722,000	20,000,000	77,234,000	*Includes 58 miles leased to Seaboard Air Lines.
Chicago & Eastern Illinois	931	813	Sept. 15, 1933	33,587,036	45,891,400	81,125,436	
Chicago & North Western	8400	8263	June 28, 1935	305,845,000*	180,835,200	507,225,890*	*Includes $18,820,000 funded debt matured and unpaid. "Total old company securities" also includes $3,000 equipment trust obligations matured and not presented.
Chicago, Attica & Southern	155	140	Aug. 4, 1931	441,200	2,294,452*	2,735,652	*Capital stock represented by 10,000 shares of no par value.
Chicago Great Western	1505	995	Mar. 1, 1935	36,069,000	91,282,900	131,899,643	
Chicago, Indianapolis & Louisville	575	542	Dec. 30, 1933	26,071,000	15,488,300	42,028,920	
Chicago, Milwaukee, St. Paul & Pacific	11,117	10,039	June 29, 1935	438,245,789	224,436,899*	695,654,206†	*Capital stock includes 1,174,060 shares common of no par value. †Includes $6,432,800 equipment trust certificates matured unpaid.
Chicago, Rock Island & Pacific	7512	5253	June 7, 1933	278,548,350	128,892,512	440,815,612	
Chicago, Rock Island & Gulf	627	635	Oct. 24, 1933	16,583,000*	637,000*	17,220,000	*All owned by C. R. I. & P. Ry. Co.
Choctaw, Oklahoma & Gulf	....	910	Oct. 24, 1933	14,436,000*	15,827,500**	30,263,500	*Includes $5,501,000 owned by the C. R. I. & P. Ry. Co. **All owned by C. R. I. & P. Ry. Co.
Peoria Terminal	15	9	Oct. 24, 1933	1,944,000*	500,000**	2,444,000	*Includes $1,014,000 owned by the C. R. I. & P. Ry. Co. **All owned by C. R. I. & P. Ry. Co.
Rock Island & Dardanelle	....	14	Oct. 24, 1933	100,000*	100,000*	200,000	*All owned by C. R. I. & P. Ry. Co.
Rock Island, Arkansas & Louisiana	....	376	Aug. 28, 1933	15,315,600*	1,768,000**	17,083,600	*Includes $3,862,000 owned by C. R. I. & P. Ry. Co. **All owned by C. R. I. & P. Ry. Co.
Rock Island Memphis Terminal	....	0.04	Oct. 24, 1933	1,300,000*	1,000*	1,301,000	*All owned by C. R. I. & P. Ry. Co.
Rock Island Omaha Terminal	....	....	Oct. 24, 1933	906,000*	10,000*	916,000	*All owned by C. R. I. & P. Ry. Co.
Rock Island, Stuttgart & Southern	....	21	Oct. 24, 1933	180,000*	300,000*	480,000	*All owned by C. R. I. & P. Ry. Co.
St. Paul & Kansas City Short Line	....	417	Aug. 28, 1933	27,812,675*	50,000**	27,862,675	*Includes $17,828,500 owned by the C. R. I. & P. Ry. Co. **All owned by C. R. I. & P. Ry. Co.
Chicago, Springfield & St. Louis	87	79	Jan. 24, 1930	500,000	204,960	704,960	This road was sold at foreclosure sale on June 25, 1931, but the receiver is still operating the property.
Colorado-Kansas	23	22	July 1, 1931	None	None	.....	Obligations and indebtedness pursuant to trustee's sale of foreclosure and receivership, $25,-170.57. Following trustee's foreclosure sale on Sept. 30, 1932, receiver was discharged and reappointed during the redemption period for the bond holders.
Denver & Rio Grande Western	2581	2286	Nov. 1,1935	114,585,000	78,903,140*	203,448,140	*Capital stock includes 300,000 shares common of no par value.
Denver & Salt Lake Western	....	38	Nov. 1, 1935	None	3,631,000	3,631,000	
Duluth, South Shore & Atlantic	549	447	Jan. 1, 1937	23,000,000	22,000,000	45,000,000	
Mineral Range	44	44	June, 1, 1937	1,598,675	1,500,000	3,098,675	
Florida East Coast	685	679	Sept. 1, 1931	57,000,000	37,500,000	97,127,075*	*Includes $627,075 receiver's certificates issued nominally as collateral for an R. F. C. loan.
Fonda, Johnstown & Gloversville	62	58	Apr. 20, 1933	6,146,000	3,000,000	9,187,068	
Fort Smith and Western	250	197	June 1, 1931	$5,244,000	1,248,000*	6,719,434	*Capital stock represented by 62,-400 shares of no par value.
Gainesville Midland	74	72	Feb. 15, 1921	949,285	550,000	1,499,285	See *Railway Age* Jan. 5, 1929, p. 67.
Georgia & Florida	409	364	Oct. 19,1929	7,446,000	13,382,441*	21,853,441	*Capital stock includes 100,000 shares common of no par value.
Georgia, Southwestern & Gulf	36	....	Jan. 2, 1933	76,800	14,700	91,500	
Albany & Northern	....	35	Jan. 2, 1933	400,000	350,000	750,000	
Louisiana & Northwest	99	93	Apr. 1, 1935	2,169,000	2,300,000	4,469,000	
Louisiana Southern	52	52	Aug. 2, 1933	200,000	100,000	300,000	
Meridian & Bigbee River	51	51	June 15, 1933	500,000	300,000	1,810,000	
Minneapolis & St. Louis	1528	1429	July 26, 1923	43,366,051	25,792,000	70,479,419	
Missouri Pacific	7174	6309	July 1, 1933	385,205,500	154,639,600	554,927,100	
Asphalt Belt	18	18	Dec. 1, 1937	None	20,000	20,000	
Boonville, St. Louis & Southern	....	0.18	June 1, 1936	250,000	250,000	500,000	
Cairo & Thebes	....	25	Dec. 1, 1937	1,699,000	10,000	1,709,000	
Chester & Mount Vernon	....	64	Dec. 1, 1937	250,000	250,000	500,000	
Fort Smith Suburban	....	7	Dec. 1, 1937	None	46,600	46,600	
Marion & Eastern	....	7	Dec. 1, 1937	None	50,000	50,000	
Missouri-Illinois	193	206	July 1, 1933	2,737,500	2,250,000	4,987,500	
Missouri Pacific R. R. Corp. in Neb.	....	349	July 1, 1933	12,735,500	4,000,000	16,735,500	
Natchez & Southern	3	3	Dec. 1,1937	None	250.000	250,000	
New Orleans, Texas & Mexico	191	173	July 1, 1933	42,970,000	14,832,900	57,802,900	
Asherton & Gulf	32	32	Dec. 1,1937	200,000	75,000	275,000	
Beaumont, Sour Lake & Western	146	84	July 1, 1933	2,057,825	85,000	2,142,825	
Houston, North Shore	....	27	July 1, 1933	850,000	100,000	950,000	

Table Continued on Following Page

Railroads in the Hands of Receivers or Trustees on December 31, 1937

Continued from Preceding Page

Road	Mileage operated	Mileage owned	Date of receivership of trusteeship	Funded debt outstanding	Capital stock outstanding	Total old company securities	Remarks
Missouri Pacific Lines *Continued*							
Houston & Brazos Valley	43	43	Dec. 1, 1937	1,000,000	422,000	1,422,000	
International-Great Northern	1155	1101	July 1, 1933	45,750,000	7,500,000	54,219,000	
Austin Dam & Suburban	....	2	Dec. 1, 1937	None	100,000	100,000	
New Iberia & Northern	113	65	Dec. 1, 1937	2,000,000	1,000,000	3,000,000	
Iberia, St. Mary & Eastern	....	48	Dec. 1, 1937	1,000,000	5,000	1,005,000	
Orange & Northwestern	62	62	Dec. 1, 1937	1,066,947	35,000	1,101,947	
St. Louis, Brownsville & Mexico	602	556	July 1, 1933	12,913,342	500,000	14,105,342	
San Antonio Southern	45	29	Dec. 1, 1937	None	250,000	250,000	
San Antonio, Uvalde & Gulf	317	314	July 1, 1933	4,413,000	280,000	4,693,000	
San Benito & Rio Grande Valley	128	128	Dec. 1, 1937	953,735	70,000	1,023,735	
Sugar Land	53	31	Dec. 1, 1937	384,000	250,000	634,000	
Rio Grande City	21	18	Dec. 1, 1937	None	22,000	22,000	
Mobile & Ohio	1202	913	June 3, 1932	31,022,740	6,007,200	39,308,940*	*Includes $500,000 receiver's certificates which are security for an R. F. C. loan.
Narragansett Pier	8	8	Jan. 31, 1936	None	133,800	133,800	
Nevada Copper Belt	30	41	Apr. 2, 1925	622,000	No value	622,000	
New York, New Haven & Hartford	2034	1248	Oct. 23, 1935	242,849,672*	206,155,300	477,593,419	*Does not include company holdings or funded debt of the company pledged, nor any funded debt matured unpaid.
Hartford & Connecticut Western	....	124	July 31, 1936	700,000*	2,967,000	4,537,797	
Old Colony	....	529	June 3, 1936	14,348,000*	25,077,600	41,152,752	*Matured July 1, 1933, not paid.
Providence, Warren & Bristol	....	14	Feb. 13, 1937	None	874,600	1,226,997	*Does not include funded debt of the company, pledged.
New York, Ontario & Western	577	318	May 20, 1937	28,780,000	58,116,983	87,028,983	
New York, Susquehanna & Western	143	133	June 1, 1937	12,545,908*	25,781,163	38,355,071	*Includes $4,305,640 funded debt matured unpaid. Non-negotiable debt due Erie Railroad Co., $6,402,826.
Wilkes-Barre & Eastern	83	63	Sept. 25, 1937	.....	.....	.....	Controlled by N. Y. S. & W. through ownership of all of its capital stock.
Norfolk Southern	831	789	July 28, 1932	15,401,000	16,000,000	32,159,000	
Oregon, Pacific & Eastern	23	23	Dec. 3, 1937	330,000	200,250	530,250	
Pittsburg, Shawmut & Northern	191	156	Aug. 1, 1905	14,655,600	15,000,000	31,700,050	
Rio Grande Southern	174	174	Dec. 16, 1929	4,509,000	4,510,000	9,065,000	
St. Louis-San Francisco	4885	4720	Nov. 1, 1932	268,098,767	114,589,791	391,478,558	
St. Louis Southwestern	1011	750	Dec. 12, 1935	32,233,000*	37,079,700	74,769,700	*Second mortgage income bond held by St. L. S. W.—funded debt statement herein therefore overstates liability by $6,957,500.
Central Arkansas & Eastern**	....	....	Dec. 17, 1935	1,085,000	150,000*	1,235,000	*Intercompany item. **Operations were discontinued on July 14.
St. Louis Southwestern of Texas	696	661	Dec. 12, 1935	15,472,500	2,750,000*	18,222,500	*Intercompany item.
Stephenville, North & South Texas	....	33	Dec. 17, 1935	2,423,000	138,300*	2,561,300	*Intercompany item.
Santa Fe, San Juan & Northern	....	32	Oct. 14, 1931	.....	500,057	.....	(Other information unavailable).
Savannah & Atlanta	145	142	Mar. 4, 1921*	3,365,870	2,250,000	6,235,870	*Changed to trusteeship, Jan. 1, 1937.
Seaboard Air Line	4308	3329*	Dec. 23, 1930	151,731,740**	85,110,662	266,817,946**	*Includes 8.50 miles owned but not operated. **Exclusive of pledged securities but inclusive of $30,736,902 matured funded debt, for the payment of which no provision has been made. "Total old company securities" also includes $1,765,100 of S. A. L. Ry. equipment obligations which are authorized to be exchanged for receiver's certificates under the Seaboard's 1935 Refunding Plan.
Chesterfield & Lancaster	33	32	Apr. 14, 1931	253,000*	500,000	753,000	*Inclusive of $67,000 principal amount of Second Mortgage 6% Bonds matured Jan. 15, 1918.
East & West Coast	Side track		Feb. 2, 1931	624,333	250,000	889,753	
Florida, Western & Northern	....	233	Feb. 2, 1931	14,999,000	5,000	15,170,719	
Georgia, Florida & Alabama	....	192	Nov. 7, 1931	1,750,000	2,010,678*	3,760,678	*Capital stock includes 10,000 shares common of no par value.
Raleigh & Charleston	20	20	May 1, 1931	550,000	574,500	1,124,500	
Seaboard-All Florida	....	184	Feb. 2, 1931	17,881,667	2,500	18,011,028	
Shelby Northwestern	22	22	Sept. 15,1932	300,000	25,000	325,000	
Spokane International	164	139	Aug. 28, 1933	4,200,000	4,200,000	8,400,000	
Coeur D'Alene & Pend D'Oreille	....	21	Aug. 30, 1933	544,000	544,000	1,088,000	
Tallulah Falls	57	57	June 24, 1923	1,519,000	323,400	1,842,400	
Wabash	2434	1976*	Dec. 1, 1931	122,323,526	138,120,767	289,435,687†	*Includes 6.83 miles owned but not operated. †Includes $15,731,583 receiver's certificates outstanding as collateral to R. F. C. for unpaid loans.
Ann Arbor	294	294	Dec. 4, 1933	9,164,541	7,250,000	16,614,541*	*Includes $200,000 receiver's certificates outstanding as collateral to R. F. C. for unpaid loans.
Waco, Beaumont, Trinity & Sabine	48	48	Feb. 8, 1930	330,000	1,113,000	1,515,734*	*Includes equipment trusts in amount of $60,000 due and unpaid.
Western Pacific	1208	1152	Aug. 2, 1935	49,290,100	75,800,000	140,109,673	
Wichita Northwestern	99	99	Nov. 10, 1922	381,750	1,690,000	2,115,750	
Wilmington, Brunswick & Southern	30	30	Mar. 17, 1933	93,750	165,000	258,750	
Wisconsin Central	1140	1014	Dec. 2, 1932	43,928,000*	27,392,200	75,150,200	*Includes $7,500,000 funded debt matured unpaid.
Yosemite Valley	78	78	Dec. 22, 1936	2,318,000	1,642,843	3,960,843	
Yreka Western	9	9	Sept. 16, 1935	None	None	17,837	

dividends of $4 on both preferred and ordinary stocks—the extra disbursement in 1936 being $2.

The Atlantic Coast Line paid $1.50 on its common stock in 1937, 50 cents more than the 1936 disbursement.

The Chesapeake & Ohio raised the quarterly dividend rate on its common stock (par $25) from 70 cents to 75 cents and, in the fourth quarter, declared an extra dividend of $1.

The Great Northern in the fourth quarter declared a dividend of $2 on its preferred stock (it has no common), the first disbursement to be made since $1 was paid upon it early in 1932.

The Gulf Mobile & Northern paid $2.50 per share on its 6 per cent preferred, the first to be paid since 1931, leaving the arrearage at the end of the year at $56 per share.

The Kansas City Southern in November declared a dividend of $1.50 on its preferred stock, as compared with $1 paid in 1936.

The Norfolk & Western paid an extra dividend of $6 on its common stock—$1 more than the extra disbursement in 1936.

The Pennsylvania paid $1.25 a share on its common stock in 1937—in 1936, $2.

The Pittsburgh & Lake Erie's disbursements on its common stock during the year aggregated $6.80 per share—in 1936 they totaled $5.

The Virginian last year paid $10.50 on its common stock, compared with $2.50 in 1936.

The Western Maryland in November paid $7 on account on the accumulated dividends on its first preferred stock. The amount still in arrears after this payment is $120.75 per share.

The Wheeling & Lake Erie in December paid an initial dividend of $5 on its common stock.

Paying Off Uncle Sam

Loans by the Reconstruction Finance Corporation to individual roads, and the extent to which these loans have been repaid, are shown in an accompanying table. Loans by the R.F.C. and the P.W.A. to the railroads have totaled $738,100,739, of which $224,839,175 had been repaid by the railroads up to the end of November, leaving a balance of $513,261,564 still owed. The government had, however, at a profit to itself of $4,-702,563, sold $106,497,000 of railroad obligations to the investing public—leaving railroad indebtedness to the government at $406,764,564. The repayments by the railroads of government loans in the first eleven months of 1937 totaled $15,579,764, and new borrowing $20,-150,000.

The railroads own lending agency, the Railroad Credit Corporation, had by the end of November distributed to the contributing carriers 76 per cent of the $75,000,000 of funds collected under the "marshaling and distributing plan."

Bankruptcy Problem Remains

Three more moderate-sized railroads—the Duluth, South Shore & Atlantic, the New York, Ontario & Western and the New York, Susquehanna & Western—were placed in trusteeship during the year. Meantime, no reorganizations of any large companies in the hands of the courts were effected during the year. Moreover, since such sharp disagreement exists among leading lawyers as to the relative status of debtors and creditors under the present federal bankrutpcy act, the outlook for the speedy discharge of trustees does not appear too bright. The mileage of line in bankruptcy is some 28 per cent of the total—and a relatively early, and substantial, increase in freight rates would appear to be the sole reliance for preventing an increase in that already-high ratio.

Equipment Prices

MORE issues of equipment trust certificates were authorized by the Interstate Commerce Commission last year than for some years. These authorizations being the source of price data on equipment, the result is that more such information was made available in 1937 than has been the case in any year since the depression reached serious proportions. This price information is presented in accompanying tables—as it was taken from finance reports issued by the Commission. Descriptions of equipment as given in the I.C.C. reports are far from complete, and where further descriptive details were readily available, they were included in the tables.

It is not believed that these bare figures afford a satisfactory source for an index of equipment price tendencies—since there are so many details of construction which are not available. For instance, information as to whether automobile cars are equipped with loaders or not is omitted from the table because the absence of information on this point cannot be taken as evidence that loaders are not included—and yet the presence or absence of loaders makes a great difference in price.

Similarly, no comparisons in prices of present-day passenger cars can safely be made with those of a few years ago unless and until the type and cost of air-conditioning equipment is known. Also, with the introduction of lighter metals in car construction, economy may indicate the wisdom of paying more for a car in order to save in hauling it around. With locomotives

Typical Locomotive Unit Prices

No.	Type	Service	Weight lb.	Tractive Force lb.	Unit Price
11	4-8-4	Psgr.	476,000	66,000	$151,000
6	4-6-4	Psgr.	409,000	48,300	142,000
10	2-10-4	Freight	.....	93,000	142,000
12	4-8-4	Psgr.	460,000	63,900	152,000
5	2-8-0	Freight	238,000	45,200	70,000
10	2-10-4	Freight	520,000	.....	133,000
2	0-8-0	Switch	279,000	.....	73,000
8	4-6-4	Psgr.	415,000	55,000	142,482
5	4-8-4	Freight	469,800	67,500	115,540
30	4-8-4	Freight	468,000	68,331	138,000
1	4-4-2	Psgr.	256,000	30,700	111,358
6	Diesel-Elec.	Psgr.	.....	.....	133,333
10	4-6-6-4	Freight	.....	.....	181,357
5	4-8-4	Psgr.	.....	.....	140,988
6	Diesel-Elec.	Switch	.....	600 h.p.	70,000
10	2-10-4	Freight	511,000	93,000	137,700
4	Diesel-Elec.	Switch	.....	600 h.p.	70,290
2	Diesel-Elec.	Switch	.....	900 h.p.	94,862
9	4-6-6-4	Freight	624,500	104,500	181,648
8	4-8-4	Psgr.	484,000	69,800	153,205
11	Electric	Psgr.	.....	.....	290,000
10	2-8-4	Freight	436,500	69,350	122,922
5	2-8-4	Freight	445,500	83,750	130,722
11	Loco. Tenders	22,000-gal.	131,000	.....	21,616
5	2-6-6-4	Freight	.....	82,300	130,000
14	4-8-8-2	Freight	642,410	123,400	162,367
14	4-8-4	Psgr.	455,200	76,650	140,473
10	Loco. Tenders	———	.....	.....	25,970
3	4-8-4	Psgr.	484,000	69,800	157,186
6	4-6-6-4	Freight	621,000	104,500	186,474
4	0-10-2	Switch	.....	.....	107,033
4	2-8-8-2	Freight	.....	.....	183,754
7	4-6-6-4	Freight	.....	.....	178,289
4	4-8-4	Freight	446,000	66,000	143,578
20	4-8-4	Psgr.	465,000	63,500	135,884
25	4-6-6-4	Freight	582,000	97,400	155,810

Some of 1937's Passenger Train Car Prices

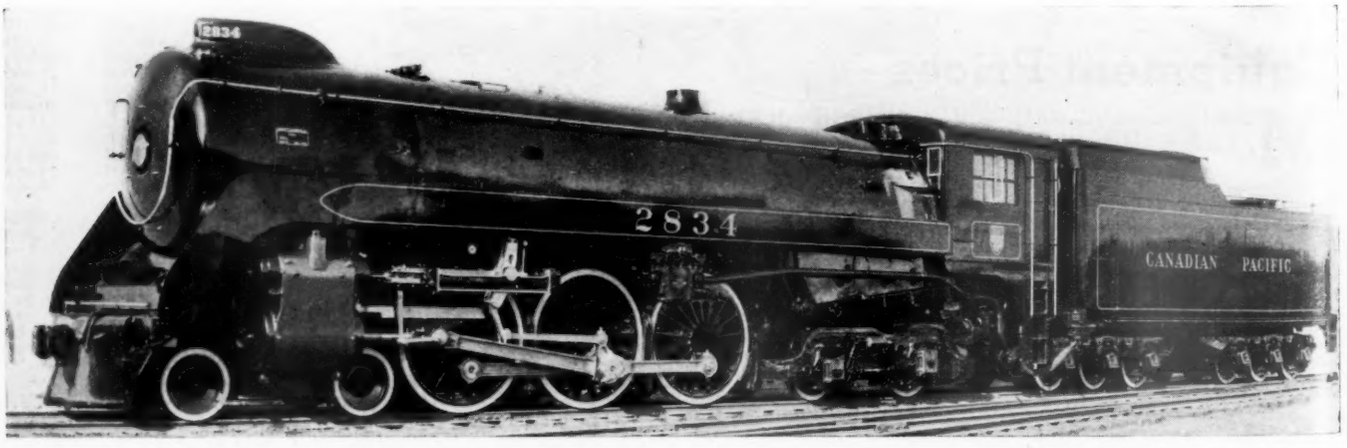
No.	Type	Length	Construction	Weight Lb.	Unit Price
1	Mail-Bagg.	73 ft. 10 in.	Lt. Weight	.....	$53,357
1	Bagg.	79 ft. 10 in.	Lt. Weight	.....	47,717
6	Club-Bagg.	79 ft. 10 in.	Lt. Weight	.....	80,958
30	Coach	79 ft. 10 in.	Lt. Weight	.....	71,487
7	Lounge	79 ft. 10 in.	Lt. Weight	.....	75,942
11	Dining	83 ft. 2 in.	Lt. Weight	.....	82,279
2	Sleeping	79 ft. 10 in.	Lt. Weight	.....	72,366
2	Sleeping	79 ft. 10 in.	Lt. Weight	.....	80,471
1	Observation	79 ft. 11 in.	Lt. Weight	.....	83,804
15	Coach	83 ft. 6¼ in.	All-Steel	128,000	44,640
15	Express	74 ft. 9¾ in.	All-Steel	133,000	21,584
5	Coach	84 ft. 2¾ in.	All-Steel	120,000	41,859
3	Express	74 ft. 3⅜ in.	All-Steel	100,400	21,766
10	Horse Exp.	70 ft. 8½ in.	All-Steel	142,600	24,578
3	Psgr. and Bagg.	67 ft. 8 in.	All-Steel	77,100	25,372
7	Chair	81 ft.	All-Steel	114,400	60,510
16	Chair	81 ft.	All-Steel	112,900	59,900
3	Dining	83 ft. 2 in.	Lt. Weight	115,000	82,000
3	Chair	79 ft. 10 in.	Lt. Weight	90,000	70,000
2	Dinette	87 ft. 6 in.	Lt. Weight	65,000	76,000
1	Dinette	64 ft.	Lt. Weight	60,000	70,000
2	Sleeping	.....	Lt. Weight	.....	83,000
20	Coach	80 ft. 8¾ in.	Lt. Weight	100,000	34,000
7	Dining	80 ft. 8¾ in.	Lt. Weight	109,600	40,000
1	Mail-Exp.	72 ft. 10 in.	Lt. Weight	92,600	23,000
5	Coach-Bagg.	80 ft. 8¾ in.	Lt. Weight	98,000	24,000
20	Psgr.	64 ft. to 78 ft. 6 in.	Lt. Weight	61,500 to 85,650	63,750
12	Coach	84 ft. 1½ in.	All-Steel	134,170	52,000
20	Psgr.-Box	.....	Wood-Lined	.....	9,198
4	Coach	83 ft. 5 in.	All-Steel	108,000	45,900
1	Din.-Chair	80 ft.	All-Steel	.....	61,200
25	Chair	79 ft. 10 in.	All-Steel	160,000	49,265
3	Dining	78 ft. 10 in.	All-Steel	181,700	68,955
1	Lounge	78 ft. 10 in.	All-Steel	.....	68,480
50	Coach	82 ft. 4½ in.	All-Steel	108,000	39,547
5	Cafeteria	82 ft. 4½ in.	All-Steel	118,000	49,680
10	Bagg.-Exp.	70 ft. 8½ in.	All-Steel	134,500	23,029
6	Coach	82 ft. 4½ in.	All-Steel	.....	42,667
4	Psgr.-Bagg.	82 ft. 4½ in.	All-Steel	.....	40,000
41	Psgr.	.....	Lt. Steel	.....	65,414
28	Coach	.....	Lt. Weight	.....	66,620
12	Coach	.....	Lt. Weight	.....	70,384
5	Dorm-Diner	2-Car Unit	Lt. Weight	.....	140,667

Freight Car Prices

No.	Type	Construction	Capacity Lb.	Unit Price
1000	Box	St. Sheathed	80,000	$2,582
600	Hopper	All-Steel	100,000	2,317
250	Gondola	All-Steel	100,000	2,395
250	Gondola	All-Steel	100,000	2,102
2000	Box	St. Sheathed	100,000	2,800
200	Refr.	St. Sheathed	100,000	4,500
500	Refr.	St. Sheathed	80,000	4,100
300	Gondola	All-Steel	140,000	4,200
25	Gondola	All-Steel	140,000	4,000
400	Auto	All-Steel	100,000	3,284
100	Phosphate	All-Steel	140,000	3,463
100	Auto-Furn	All-Steel	100,000	3,633
100	Auto	All-Steel	100,000	3,794
600	Hopper	All-Steel	100,000	2,106
250	Gondola	All-Steel	100,000	2,170
250	Box	All-Steel	100,000	2,493
1450	Gondola	All-Steel	140,000	2,593
550	Gondola	All-Steel	140,000	2,932
2000	Box	Steel	100,000	2,331
1000	Hopper	All-Steel	180,000	3,990
500	Hopper	All-Steel	140,000	3,770
500	Gondola	All-Steel	100,000	3,180
100	Box	All-Steel	100,000	3,235
500	Box	All-Steel	80,000	2,616
500	Hopper	All-Steel	100,000	2,069
500	Hopper	All-Steel	100,000	2,072
500	Gondola	All-Steel	100,000	2,091
500	Box	All-Steel	100,000	2,410
50	Stock	All-Steel	80,000	2,486
50	Caboose	All-Steel	60,000	4,376
25	Dry Hopper	All-Steel	140,000	3,812
500	Hopper	All-Steel	140,000	2,915
200	Auto	Wood-Lined	100,000	3,517
300	Auto	Wood-Lined	100,000	2,947
150	Ballast	All-Steel	100,000	2,530
100	Auto	St. Frame	100,000	3,430
150	Auto	St. Frame	100,000	2,869
600	Box	St. Frame	100,000	2,630
100	Hopper	All-Steel	110,000	2,150
300	Gondola	Composite	100,000	1,955
100	Ballast	All-Steel	100,000	3,135
198	Box	Single Sheathed	100,000	2,103
499	Box	St. Sheathed	100,000	1,926
500	Box	St. Sheathed	100,000	1,690
498	Box	St. Sheathed	100,000	1,660
199	Auto	Single Sheathed	80,000	2,678
100	Auto	Single Sheathed	100,000	2,593
300	Hopper	All-Steel	140,000	2,097
1000	Gondola	Steel Frame	140,000	2,562
500	Hopper	All-Steel	100,000	2,060
500	Auto	St. Sheathed	100,000	2,850
350	Auto	.....	100,000	3,400
1000	Box	Wood-Lined	80,000	2,599
500	Box	Wood-Lined	80,000	2,590
500	Auto	Wood-Lined	80,000	3,337
500	Hopper	All-Steel	100,000	2,290
1000	Gondola	All-Steel	100,000	2,368
100	Ballast	All-Steel	140,000	3,983
1500	Ore	All-Steel	150,000	3,229
50	Hopper	All-Steel	140,000	3,930
550	Gondola	All-Steel	100,000	2,464
200	Gondola	All-Steel	100,000	2,567
100	Gondola	All-Steel	140,000	3,338
200	Hopper	All-Steel	100,000	2,727
1000	Box	Wood-Lined	100,000	3,170
500	Ore	All-Steel	150,000	2,435
500	Gondola	All-Steel	100,000	2,790
500	Hopper	All-Steel	100,000	2,394
500	Hopper	All-Steel	100,000	2,387
500	Box	Wood-Lined	80,000	2,954
500	Box	Wood-Lined	80,000	2,991
200	Auto	Wood-Lined	80,000	3,760
600	Box	Wood-Lined	80,000	3,210
300	Refr.	Wood-Lined	80,000	4,492
750	Box	Wood-Lined	100,000	2,504
50	Box	All-Steel	100,000	3,060
100	Hopper	All-Steel	140,000	3,409
75	Dry Hopper	All-Steel	140,000	3,818
5	Caboose	All-Steel	.....	3,920
150	Box	St. Sheathed	100,000	2,500
50	Hopper	All-Steel	140,000	2,531
2700	Hopper	All-Steel	100,000	2,146
327	Ballast	All-Steel	100,000	2,463
500	Gondola	All-Steel	80,000	2,171
500	Stock	All-Steel	80,000	2,250
100	Auto	.....	80,000	3,464
125	Auto	.....	100,000	3,441
25	Auto	.....	100,000	4,186
700	Gondola	All-Steel	100,000	2,211
900	Box	All-Steel	100,000	2,471
100	Box	All-Steel	100,000	2,447
500	Hopper	All-Steel	110,000	2,192
25	Caboose	All-Steel	60,000	4,478
500	Hopper	All-Steel	110,000	2,168
500	Box	All-Steel	80,000	2,258
500	Box	Steel	100,000	2,451
500	Gondola	Steel	100,000	2,222
100	Auto	Steel	100,000	3,441
75	Hopper	Steel	100,000	2,058
25	Dry Hopper	Steel	140,000	3,807
750	Gondola	All-Steel	100,000	2,624
250	Gondola	All-Steel	140,000	2,895
500	Flat	St. Underframe	100,000	2,358
500	Box	Wood-Sheathed	100,000	2,909
850	Auto	St. Sheathed	100,000	2,665
300	Dry Hopper	All-Steel	140,000	2,945
1500	Gondola	All-Steel	140,000	2,705
25	Caboose	All-Steel	60,000	3,859
100	Gondola	All-Steel	140,000	3,250
1000	Box	All-Steel	100,000	2,325
75	Auto	Wood-Lined	100,000	3,641
350	Auto	Wood-Lined	100,000	3,644
400	Auto	Wood-Lined	100,000	3,083
350	Auto	Wood-Lined	100,000	2,811
100	Ballast	Steel	100,000	2,307
250	Box	Wood-Lined	100,000	2,531
250	Box	Wood-Lined	100,000	2,518
250	Box	Wood-Lined	100,000	2,527
250	Box	Wood-Lined	100,000	2,535
100	Gondola	Wood Body	140,000	3,297
500	Box	Steel	100,000	2,904
100	Hopper	Steel	100,000	2,480
1000	Gondola	All-Steel	140,000	2,785
100	Auto	All-Steel	100,000	3,067
500	Box	All-Steel	100,000	2,867
100	Gondola	All-Steel	100,000	2,547
200	Box	Wood-Lined	100,000	2,554
50	Flat	St. Underframe	100,000	2,324
100	Hopper	All-Steel	100,000	2,394
250	Box	.....	100,000	3,277
100	Gondola	All-Steel	100,000	3,078
100	Hopper	All-Steel	100,000	2,484
1000	Ballast	All-Steel	100,000	3,003
200	Tank	All-Steel	12,500 gal.	3,369
50	Box	Alloy Steel	100,000	3,550

also, price comparisons are meaningless unless assurance can be given that like is being compared with like.

With all these reservations, it is nevertheless believed that the figures are of interest and value, if only as an easy source of reference as to what "typical" equipment costs—and a reminder that "it costs money to make money" by utilizing new and modern equipment; and that some profits are necessary to the industry if it is to present the up-to-date appearance from an equipment standpoint which is desired by all who wish it well.

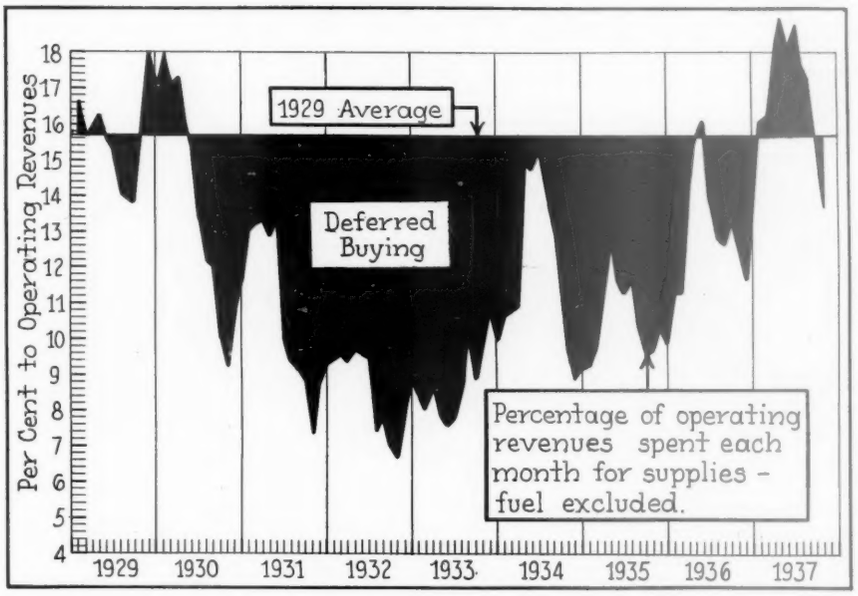


One of 30 Semi-Streamlined Locomotives Built By the Montreal Locomotive Works for the Canadian Pacific—These Locomotives, Weighing 353,500 Lb. With 186,700 Lb. on the Drivers Have a Tractive Force of 45,250 Lb.

Railway Buying Loses Momentum

Totals for 1937 again pass billion dollar mark but barely exceed 1936, as higher costs and uneasiness curb spending

By D. A. Steel
Purchases and Stores Editor



The Decline and Recovery in the Relation Between Railway Purchases of Material and Gross Operating Revenues per Month, January, 1929, to October, 1937. Fuel and Equipment Excluded

AS nearly as can be determined at this time, with incomplete records for November and December, railway buying in 1937 exceeded that in 1936 but with little margin to spare after deductions for increases in the costs of materials.

As in previous years, the purchases of fuel and materials were computed from reports made to this paper each month by the railroads (90 per cent of the Class I mileage reporting ten months' figures). Expenditures for equipment were computed from this paper's week-to-week record of the orders placed by the railroads, and the lesser divisions of the expenditures for materials include the freight paid for transportation on foreign lines, but exclude heat, light and power and services, and also materials furnished by contractors of construction. Materials for equipment built in railroad shops are included under materials.

The totals included approximately $43,000,000 of rails, $58,500,000 of ties, $38,200,000 of lumber, $36,400,000 of bar and sheet steel, $52,500,000 of locomotive and car castings, $33,300,000 of wheels, tires and axles, and $22,-

Annual Purchases—Supplies and Equipment—Class I Roads*

	Materials received from man'f't'rs (000)	Equipment ordered from man'f'trs (000)	Total from man'f't'rs† (000)	Fuel (000)	Total including fuel (000)
1929...	$991,795	$435,816	$1,427,611	$336,805	$1,764,416
1930...	727,223	148,529	875,752	308,277	1,184,029
1931...	451,651	31,330	482,981	243,349	726,330
1932...	268,100	2,976	271,076	177,000	448,076
1933...	266,846	6,496	273,342	180,904	454,246
1934...	395,012	69,142	464,154	209,488	673,642
1935...	365,830	36,948	402,778	228,720	631,498
1936...	555,841	192,867	748,708	266,463	1,015,171
1937...	703,062	143,000	846,062	279,534	1,125,596

* Subject to revision.

this preliminary survey of annual purchases are based on details furnished by a smaller though representative number of railroads.

$846,000,000 From Manufacturers

The purchases of materials, equipment and fuel totaled approximately $1,125,000,000 in 1937, including approximately $703,000,000 of materials exclusive of fuel, from manufacturers, and approximately $143,000,000 of new equipment from manufacturers—a combined total of approximately $846,000,000 from manufacturers, while the remaining $280,000,000 went for fuel. The totals in-

Purchases of Material and Supplies—Class I Roads*

	Fuel		Rail		Crossties	
	1937 (000)	1936 (000)	1937 (000)	1936 (000)	1937 (000)	1936 (000)
January	$26,054	$21,859	$3,128	$1,107	$3,923	$3,027
February	26,328	24,355	3,858	2,426	3,398	2,371
March	30,644	22,304	6,224	4,207	4,985	3,312
April	19,583	20,626	5,343	5,504	5,107	3,867
May	20,516	19,447	5,008	5,700	5,029	4,112
June	22,463	19,367	5,764	3,836	6,017	4,150
July	21,873	20,086	3,813	1,879	5,703	4,137
August	21,243	20,281	2,788	1,911	6,029	4,110
September	22,237	21,323	2,702	2,334	5,667	4,004
October	23,966	23,945	1,562	2,610	4,409	3,862
November	23,140	24,555	1,508	1,539	4,257	2,976
December	21,487	28,315	1,400	2,477	3,953	3,991
12 Mos.†	279,534	266,463	43,098	35,530	58,477	43,919

	Other Material		Total		Total Less Fuel	
	1937 (000)	1936 (000)	1937 (000)	1936 (000)	1937 (000)	1936 (000)
January	$46,862	$29,656	$79,967	$55,649	$53,913	$33,790
February	45,415	29,146	78,999	58,298	52,671	33,943
March	55,942	36,612	97,795	66,435	67,151	44,131
April	56,536	39,553	86,569	69,550	66,986	48,924
May	54,051	41,859	84,604	71,118	64,088	51,671
June	54,591	38,194	88,835	65,547	66,372	46,180
July	55,091	38,882	86,480	64,984	64,607	44,898
August	52,894	38,660	82,954	64,962	61,711	44,682
September	47,038	41,390	77,644	69,051	55,407	47,728
October	42,563	42,269	72,500	72,686	48,534	48,741
November	41,095	37,121	70,000	66,191	46,860	41,636
December	38,160	43,049	65,000	77,832	43,513	49,517
12 Mos.†	590,238	456,391	971,347	802,303	691,813	535,841

* Subject to revision.
† Excludes undistributed materials for equipment built in Pennsylvania shops.

400,000 of lubricating and illuminating oils, greases, etc. Other details are tabulated.

Purchases of materials for maintenance of way totaled approximately $231,000,000, purchases for maintenance of equipment totaled approximately $309,000,000, while materials for trains and stations and for conducting transportation, exclusive of fuel, totaled approximately $140,000,000.

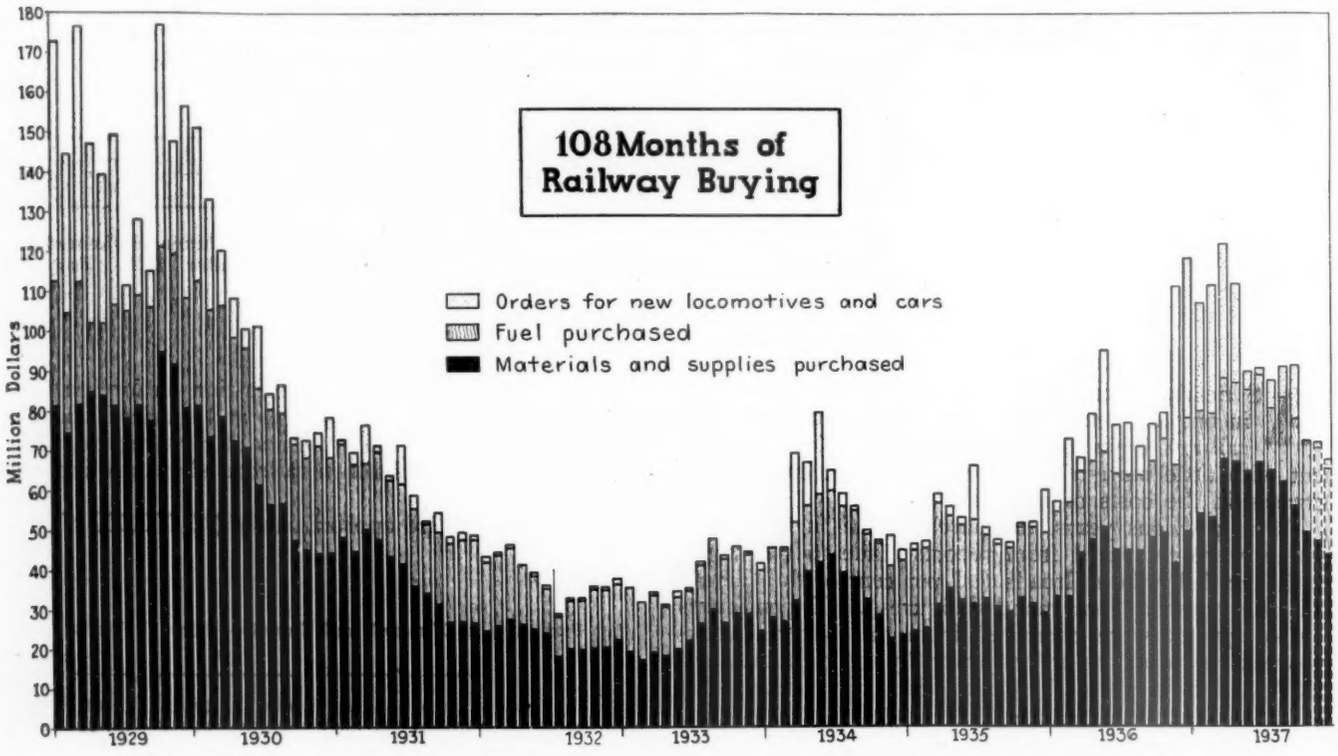
Buying From Manufacturers Up 13 Per Cent

Last year was the second consecutive year when purchases exceeded a billion dollars, and the total, including fuel and equipment, was $490,000,000 more than in 1935 and $621,000,000 more than in 1933, but dollar for dollar it was only 10 per cent over 1936 and was still $639,000,000, or 35 per cent, under 1929. Purchases of materials from manufacturers, unadjusted for prices, were 13 per cent larger than in 1936, but, even with increased costs of materials, the cost of new equipment ordered from manufacturers in 1937 was 25 per cent below the corresponding figure for 1936, although about equal to 1930; these figures are based on the value of the orders placed for equipment, not on the capital expenditures made when the equipment is delivered and which, therefore, include equipment ordered in the previous year.

While total purchases last year were large and attest to the huge and continuing capacity of the railroads as consumers, they would have been still larger had not declines in recent months almost erased the gains made earlier in the year. It was, in fact, another year of striking contrasts in railway buying—a mixture of boom and depression, a feast and a famine for industry, and a graphic demonstration, on the one hand, of the restorative powers of the railroads and their spending when they are making money and of their abstemiousness, on the other hand, when earnings fall.

At this time last year, prices were soaring and so was railway buying, partly because of the advancing prices and also because of increases in car loadings and prospects for heavier traffic. The heavier buying applied equally to equipment and materials and an unprecedented number of contracts were made for a whole year's supply of material. This lasted for several months, until railroads had ordered about all of the equipment their earnings would allow, pending the delivery of equipment ordered, and until a narrowing margin between expenses and revenues caused by increases in taxes, wages and materials, combined with a growing uneasiness about business conditions to precipitate another severe slump in buying.

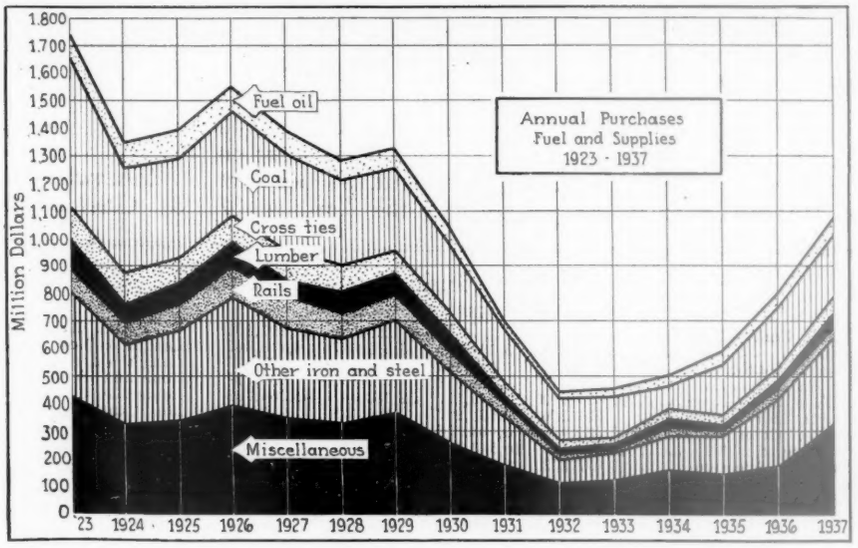
Commitments for new locomotives and cars from builders declined from a first quarter total of approximately $105,000,000, or $25,000,000 per month, to approximately $5,000,000 in May, $2,250,000 in June, and not to exceed $7,000,000 for the entire four months ending December 31, or only about $1,700,000 per month.



Railway Purchases of Material and Supplies and Fuel, and the Estimated Value of Orders for Equipment, January, 1929 to December, 1937, as Compiled by the *Railway Age*

The declines were not so great in supply buying and are less easily traced, because the totals each month represent the value of material received in the month, and the intervals between orders and deliveries were lengthened by the heavier rate of buying. However, the purchases of materials and supplies from manufacturers, after increasing from approximately $54,000,000 in January to $66,000,000 in June, declined to $48,500,000 in October, and the present estimate of purchases in December of $43,000,000 is a decline of 35 per cent from June and a decline of 20 per cent from January.

Largely because of the rising trend of buying in 1936, the declines in 1937 are more sharply defined when compared with 1936. Purchases of materials and equipment from manufacturers during the first three months of 1937 were 105 per cent higher than in the corresponding period of 1936, and they were 24 per cent higher in the third quarter, but the total for the last three months



Trends of Annual Purchases of Class I Railroads for Fuel, Material and Supplies, Exclusive of New Equipment, 1923 to 1937—Unadjusted for Change in Prices

was 38 per cent below the last quarter of 1936, notwithstanding increased costs.

Increases General

All but 3 of 90 railroads reporting figures participated in the buying boom that occurred last year, and the increases on many roads were unusually large. Purchases of materials and fuel, exclusive of new equipment, during the ten months were increased by 59 per cent on the Ann Arbor, 31 per cent on the Atlanta, Birmingham & Coast, 42 per cent on the Baltimore & Ohio, 37 per cent on the Central of Georgia and over 100 per cent on the Chicago & Illinois Midland. The increases amounted to 66 per cent on the Burlington, 39 per cent on the Columbus & Greenville, 35 per cent on the Detroit, Toledo & Ironton, 83 per cent on the Duluth,

Classified Purchases, Class I Roads, 1937*

	(000)	(000)
Frogs, switches and track fastenings	$44,722	
Track tools and miscellaneous	5,904	
Interlocking and signal and Tel. & Tel.	17,526	
Brick, cement, lime, stone, etc.	7,430	
B & B lumber and piling	14,743	
Switch ties	11,567	
Crossties	58,477	
Bridges, turntables, etc.	1,866	
Ballast and riprap	16,387	
Rail—new and usable	43,098	
Fuel and water station material, etc.	6,795	
Chemicals for timber treatment	2,787	
Total Maintenance of Way and Structures		$231,302
Bolts, nuts, washers, etc.	15,978	
Springs	2,649	
Boiler tubes, Superheater units, etc.	6,500	
Tubing and soft metals	4,227	
Bar and sheet iron and steel	36,428	
Locomotive and car forgings	24,014	
Locomotive and car castings	52,518	
Brass castings and journal bearings	35,549	
Air brake material	9,082	
Locomotive appliances	15,146	
Passenger car trimmings	10,435	
Electrical materials	17,486	
Shop fuel	8,691	
Foundry supplies, firebrick, clay	1,078	
Wheels, tires and axles	33,392	
Locomotive and car lumber	23,334	
Machinery, boilers, fireboxes, and miscellaneous	13,109	
Total Maintenance of Equipment		309,834
Train and station supplies	14,726	
Oil house material	22,460	
Ice house supplies	9,166	
Fuel for locomotives	279,534	
Commissary supplies	17,125	
Total Conducting Transportation		343,011
Iron and steel pipe and fittings	7,726	
Electrical material for buildings	5,149	
Hardware	15,812	
Rubber and leather	8,974	
Glass, drugs, paint, etc.	25,641	
Stationery and printing	17,449	
Miscellaneous and unclassified	17,698	
Total Common to All Departments		98,449
Grand Total		$982,596†

* Purchases other than ties, rail and fuel estimated on the basis of reports from 29 railroads—Subject to revision.

† Includes $11,249,000 of unclassified materials for equipment built in Pennsylvania shops.

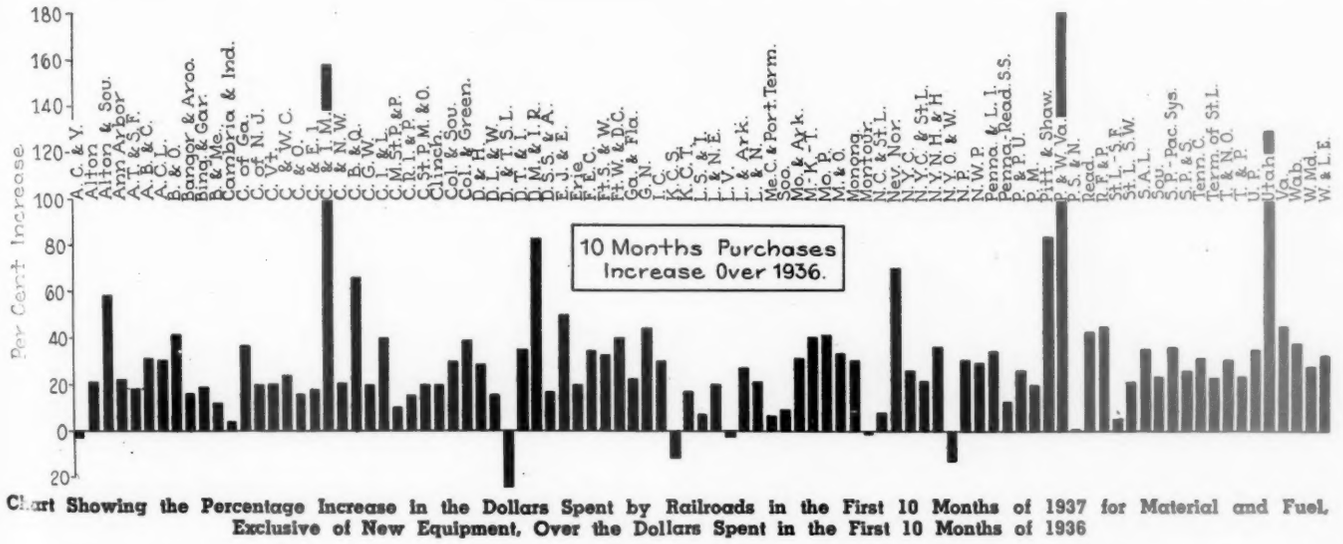


Chart Showing the Percentage Increase in the Dollars Spent by Railroads in the First 10 Months of 1937 for Material and Fuel, Exclusive of New Equipment, Over the Dollars Spent in the First 10 Months of 1936

Missabe & Iron Range, 49 per cent on the Elgin, Joliet & Eastern and 37 per cent on the Florida East Coast. During the same period, the purchases of materials and fuel were greater than in 1936 by 44 per cent on the Great Northern, 30 per cent on the Illinois Central, 40 per cent on the Missouri-Kansas-Texas, 38 per cent on the New York, New Haven & Hartford, 34 per cent on the Pennsylvania, 42 per cent on the Reading, 37 per cent on the Seaboard Air Line, 38 per cent on the Southern Pacific, 37 per cent on the Union Pacific, 45 per cent on the Virginian and 38 per cent on the Wabash.

Inventories Up 30 Per Cent

Meanwhile, inventories have increased. On October 31, Class I railroads, excluding switching and terminal

Purchases of Fuel and Supplies—10 Months

	1934	1935	1936	1937
Akron, Canton & Y'gst'n	$.....	$.....	$ 299,068	$ 291,501
Alton	3,503,056	3,385,789	3,390,027	4,118,845
Alton & Southern	.....	160,464	203,248	322,777
Ann Arbor	.....	723,688	776,531	950,127
A. T. & S. F. Lines	20,097,692	21,895,717	32,380,387	46,264,008
Atlanta, Birm. & Coast.	589,276	626,987	691,115	911,983
Atlantic Coast Line	7,382,487	6,464,370	7,666,167	9,904,037
Baltimore & Ohio	19,804,459	16,587,242	24,673,727	35,035,092
Bangor & Aroostook	1,077,172	1,195,147	1,055,024	1,245,193
Bessemer & Lake Erie	.....	.....	.....	.....
Bingham & Garfield	.....	127,562	145,256	172,992
Boston & Maine	8,616,378	5,826,203	6,461,878	7,242,370
Burlington-Rock Island	.....	.....	79,596	129,010
Cambria & Indiana	116,344	96,614	129,393	134,431
Central of Georgia	2,411,128	2,549,217	2,849,767	3,769,051
Central of New Jersey	3,345,610*	3,765,728	4,515,320	5,420,214
Central Vermont	1,040,138	1,241,232	1,334,232	1,598,717
Charleston & W. Carolina	357,001	370,808	391,327	487,328
Chesapeake & Ohio	12,226,682	10,080,126	14,456,682	16,887,030
Chicago & Eastern Ill.	1,895,878	2,038,254	2,556,676	3,039,629
Chicago & Ill. Midland	429,204	431,279	432,141	1,126,661
Chicago & North West.	13,833,006	13,068,726	18,847,280	22,857,173*
Chicago, Burl. & Quincy	13,033,797	12,942,055	16,568,123*	27,281,946
Chicago Great Western	2,889,426	2,899,465	3,855,367	4,640,045
Chicago, Ind. & Louis.	878,868	874,288	1,375,418	1,935,375*
Chi. R. I. & Pac. Lines	10,378,771	10,534,560	16,219,190	18,750,102
Chi. St. P. Minn. & O.	2,927,072	3,000,067	3,820,993	4,628,203*
Clinchfield	830,368	811,175	953,463	1,146,125
Colorado & Southern	.....	1,066,157	1,397,364*	1,813,900
Columbus & Greenville	179,200	181,862	251,497	350,992
Delaware & Hudson	4,430,453	4,302,896	4,478,290	5,770,853
Del., Lack. & Western	6,290,372	6,277,745	6,981,812*	8,053,888*
Det. & Tol. Shore Line	.....	.....	399,693	299,260
Det. Toledo & Ironton	629,246	869,866	783,103	1,061,470
Dul. Missabe & I. R.	1,464,742	1,259,416	1,939,812	3,552,292
Dul. S. S. & Atlantic	351,341	391,982	414,231	486,712
Elgin, Joliet & Eastern	1,144,419	1,393,887	2,098,159	3,116,122
Erie	12,654,323	9,676,363	11,539,115	13,716,878
Florida East Coast	1,145,499	1,291,776	1,312,555	1,792,136
Ft. Smith & West	113,423	79,687	110,176	148,845
Ft. Worth & Denv. City	.....	951,677	909,908	1,278,546
Georgia & Florida	.....	286,020	294,652	360,062
Great Northern	12,792,451	10,724,354	13,481,576	19,327,472
Gulf, Mobile & Nor.	.....	.....	.....	.....
Illinois Central	15,706,612	14,063,042	17,453,658	22,450,297
Kansas City Southern	1,375,732	1,291,123	2,459,520	2,163,618*
Kansas City Terminal	.....	588,429	667,021	787,186
Lake Sup. & Ishpeming	204,921	172,614	283,582	304,116
Lehigh & New England	606,012	425,609	588,969	701,223
Lehigh Valley	.....	6,881,567	8,099,751	8,535,778
Louisiana & Arkansas	$808,636	$820,708	$1,117,521	$1,412,154
Louisville & Nashville	8,534,151	9,646,956	12,492,615	14,957,592
Me. Cent.(IncPort.Terml)	2,526,714	2,010,174	2,451,710	2,584,643
Minn. St. P. & S. S. M.	3,785,202	3,969,019	4,519,061	4,918,707
Missouri & Arkansas	.....	129,210	162,440	211,661*
Missouri-Kansas-Texas	4,172,373	3,474,247	3,632,101	5,056,861
Missouri Pacific Lines	17,397,134	17,041,350	22,832,952*	32,371,870*
Mobile & Ohio	1,279,764	1,560,858	1,658,507	2,206,067
Monongahela	331,213	267,049	309,885	402,291
Montour	.....	.....	303,773	301,650
Nash., Chat. & St. Louis	2,227,203	1,935,823	2,670,093	2,816,752
Nevada Northern	.....	93,746	134,855	227,631
New York Central Sys.	48,448,461	44,243,136	59,878,100	75,499,387
N. Y., Chi. & St. Louis	4,637,651	4,158,896	6,032,544	7,321,058
N. Y., New Hav. & Hart.	8,837,178	8,818,592	10,648,366	14,696,060
N. Y., Ont. & Western	.....	1,297,364	1,445,350	1,207,821
Northern Pacific	8,866,437	9,118,646	11,563,602	15,034,135
Northwestern Pacific	301,872	275,830	365,353	471,376
Penna. & Long Island	48,478,663	37,992,095	58,868,991	78,849,955
Penna.-Read. S. S. Lines	.....	329,335	396,771	443,165
Peoria & Pekin Union	.....	263,021	312,376	393,122
Pere Marquette	3,924,077	4,296,807	5,211,617	6,284,076
Pittsburgh & Shawmut	89,040	110,811	93,524	171,951
Pitt., Shawmut & North.	189,430	142,665	149,108	150,205
Pitt. & W. Va.	.....	.....	573,968	1,488,496
Reading	6,757,279	6,199,198	7,214,566	10,274,628
Richmond, Fred. & Pot.	1,222,969	1,287,094	1,406,803	2,044,960
St. Louis-San Francisco	8,530,505	8,103,808	9,304,006	12,044,984
St. Louis Southwestern	1,173,140	1,567,229	3,758,990	5,183,901
Seaboard Air Line	8,183,972	5,553,516	7,547,303	10,317,107
Southern	13,872,296	14,554,385	18,694,390	22,799,366
Southern Pac-Pac Sys.	16,444,226	15,889,171	24,005,187	33,272,033
Sou. Pac.-Tex. & La.	4,780,364	4,261,246	6,539,445	8,516,906
Spokane, Port. & Seattle	1,604,238*	938,004	1,359,939	1,704,286
Tennessee Central	333,918	348,071	442,459	585,335
Terminal of St. Louis	.....	1,006,965	1,330,227	1,634,491
Texas & Pacific	3,074,173	3,454,270	4,949,025	6,087,223
Union Pacific Sys.	19,770,145	25,276,796	31,675,006	43,724,679
Utah	70,325	90,113	113,161	257,481
Virginian	1,297,466	1,415,115	2,597,770	3,779,771
Wabash	6,283,656	5,296,722	7,344,747	10,195,981
Western Maryland	3,007,533	2,414,218	2,889,387	3,700,555
Western Pacific	2,270,000	3,120,950	5,253,100	.....
Wheeling & Lake Erie	2,054,836	2,549,796	2,600,635	3,422,864

* October estimated.

Fuel and Materials in Stock—Book Values—October 31

	Rail—New & S. H.		Total	
	1936	1937	1936	1937
Akron, Canton & Y'gst'n	$ 13,747	$ 12,208	$ 96,868	$ 103,320
Alton	63,328	101,255	746,329	951,414
Alton & Southern	22,089	23,847	65,389	95,425
Ann Arbor	17,489	17,251	255,864	344,911
Atchison, Top. & Santa Fe	2,657,495	3,684,136	17,138,906	25,654,067
Atlantic Coast Line	406,207	450,365	2,877,292	3,917,184
Baltimore & Ohio	396,155	1,329,695	9,225,427	13,443,998
Bingham & Garfield	16,100	10,733	59,800	49,273
Boston & Maine	463,209	260,199	4,214,494	3,906,237*
Bangor & Aroostook	70,211	64,485	775,995	933,506
Cambria & Indiana	13,433	3,455	63,131	58,884
Central of Georgia	19,746	33,262	1,030,507	1,375,389
Central of New Jersey	.....	184,062	.....	1,973,402
Central Vermont	53,896	45,246	478,310	642,888
Charleston & West'n Car.	26,318	16,218	160,704	175,980
Chesapeake & Ohio	.....	.....	3,966,036	4,633,642
Chicago & Eastern Illinois	238,878	258,984	845,926	1,181,583
Chi. & Illinois Midland	24,328	6,398	271,690	294,824
Chi. & North Western	1,325,808	1,526,242*	8,808,944	11,865,319*
Chi., Burl. & Quincy	755,601*	758,406	7,766,679*	11,236,096
Chicago Great Western	8,282	65,115	618,539	886,272
Chicago, Ind. & Louisville	75,722	138,772*	750,122	1,054,648*
Chi., Rock Island & Pac.	1,198,765	590,246	7,166,961	7,525,491
Chi., St. P. M. & Omaha	178,701	341,485*	1,154,843	1,657,557
Clinchfield	13,085	12,463	411,827	414,009
Colorado & Southern	104,111	113,031	403,011	513,887
Columbus & Greenville	2,082	14,912	126,846	154,328
Delaware & Hudson	121,564	159,120	2,196,313	2,888,097
Detroit, Toledo & Ironton	21,068	49,537	388,856	585,194
Det. & Toledo Shore Line	15,041	6,275	94,753	93,537
Dul., Mis. & Iron Range	70,609	153,501	1,023,407	1,873,472
Dul., S. S. & Atlantic	84,370	39,808	294,977	250,224
Elgin, Joliet & Eastern	30,220	36,733	780,831	1,085,585
Erie	387,297	248,807	3,453,474	4,338,911
Florida East Coast	100,329	381,489	1,465,009	2,067,477
Ft. Smith & Western	4,724	4,484	166,558	173,293
Ft. Worth & Denver City	.....	38,594	.....	535,479
Great Northern	631,824	861,795	7,391,688	9,142,010
Illinois Central	41,457	52,902	5,805,607	8,526,577
Kansas City Southern	81,036	137,454*	1,320,567	1,316,573*
Kansas City Terminal	14,032	12,330	163,115	192,800
Lake Sup. & Ishpeming	84,842	56,920	340,520	327,825
Lehigh & New England	$ 80,729	$ 86,853	$ 364,246	$ 416,873
Lehigh Valley	134,024	199,735	2,935,032	3,421,254
Louisiana & Arkansas	115,512	102,839	796,053	910,426
Louisville & Nashville	533,027	424,558	7,381,082	8,854,866
Maine Central (Inc. Port. Term'l)	132,023	185,141	1,395,357	1,341,275
Minn., St.P. & S.S. Marie	122,831	187,057	1,785,530	1,732,302
Missouri-Kansas-Texas	176,601	95,547	1,981,143	2,519,732
Mobile & Ohio	52,716	42,000†	784,833	1,106,118†
Monongahela	5,278	13,862	188,351	215,955
Montour	12,655	1,128	142,541	149,056
Nash., Chatt. & St. Louis	126,679	78,858	1,624,011	1,684,276
Nevada Northern	4,793	12,838	93,976	167,687
New York Central	.....	.....	25,592,881	33,269,052
N.Y., Chi. & St. Louis	.....	.....	1,524,735	2,104,942
N.Y., New Hav. & Hart.	944,040	665,490	4,949,303	5,901,678
New York, Ont. & West.	69,001	39,217	652,612	605,785
Northwestern Pacific	39,276	78,838	163,149	233,389
Northern Pacific	159,413	113,695	6,601,138	8,556,551
Penna. & Long Island	4,612,550	1,560,614	30,686,044	49,219,863
Peoria & Pekin Union	9,626	17,246	101,616	122,290
Pere Marquette	.....	.....	1,499,238	2,006,822
Pittsburg & Shawmut	25,455	13,545	97,331	124,007
Pitt., & W. Va.	55,321	74,542	212,464	583,452
Pitt., Shawmut & North	16,706	3,509	99,470	66,057
Reading	.....	552,123	.....	6,497,589
Richmond, Fred. & Pot.	.....	.....	765,573	846,389
St. Louis-San Francisco	462,751	388,668	3,961,724	5,443,820
St. Louis Southwestern	122,746	172,399	1,430,350	2,077,504
Seaboard Air Line	606,954	706,461	3,658,082	5,071,320
Southern	264,847	307,022	6,598,949	8,169,047
Sou. Pac.-Pac. Lines	896,242	699,404	9,302,967	12,342,038
S. Pac.-Tex. & La. Lines	560,899	490,997	4,149,956	4,884,754
Spokane, Port. & Seattle	87,813	73,120	583,483	805,861
Tennessee Central	.....	.....	180,013	288,679
Terminal of St. Louis	66,171	45,868	411,389	453,976
Texas & Pacific	299,105	418,755	3,530,018	4,244,779
Union Pacific	3,404,728	2,829,250	19,861,921	29,136,696
Utah	25,685	45,132	182,473	255,847
Virginian	91,767	120,278	1,555,846	2,131,349
Wabash	352,956	509,868	2,082,129	2,878,404
Western Maryland	2,430*	6,757	1,463,690*	1,911,109
Wheeling & Lake Erie	138,649	36,029	996,223	1,267,851

*September
†Estimated

companies, reported materials and supplies on hand totaling approximately $382,500,000 of fuel, $34,800,000 of new and secondhand rails, $39,100,000 of ties, $268,900,000 of repair parts and miscellaneous supplies, and $6,400,000 of unsold scrap. This was a 15 per cent increase in fuel, a 2 per cent reduction in rails, a 23 per cent increase in ties and a 30 per cent increase in miscellaneous materials over the corresponding values on October 31, 1936. The increase was the largest in several years. How much of it represents increased prices, how much, normal replenishments of depleted working capital, and how much of it represents surplus are questions beyond the scope of this summary.

Divisions of Supplies in Stock, Class I Railroads—October 31

	Fuel (000)	Ties (000)	Rail (000)	Stores Stock (000)	Scrap (000)	Total (000)
1934...	$19,500	$42,000	$39,000	$202,000	$7,500	$310,000
1935...	22,100	36,500	36,000	179,000	6,400	281,000
1936...	21,700	31,700	35,700	199,600	6,000	294,700
1937...	33,300	39,100	34,800	268,900	6,400	382,500

Deferred Buying Still Large

While the dollars spent by the railroads for materials and supplies in 1937 were lower than in 1929, there were eight consecutive months last year, beginning with January, when purchases were a larger percentage of operating revenues than in 1929. This is contrasted with the 80 consecutive months prior to 1937, when the purchases were a smaller percentage of operating revenues than in 1929. In that year, purchases of materials, exclusive of fuel and equipment, averaged 15.7 per cent of operating revenues. Last June they were 18.8 per cent. During 1932, they declined to 6.9 per cent of operating revenues. The progressive relation between purchases and revenues has been employed as a measure of deferred buying, and as an indicator of the extent to which railroads are catching up with it. This is on the assumption that while less material is required by railroads in periods of light traffic than in periods of heavy traffic, the purchases of material which *are* needed for adequate maintenance should bear a reasonably constant relation to the revenues. After adjusting for changing prices, it has been computed that in the period prior to 1937, the railroads spent approximately $750,000,000 less in the aggregate for materials, exclusive of equipment and fuel, than would have been spent if they had consistently appropriated as much per dollar of their operating revenues as in 1929. Following the same reasoning, they spent $57,000,000 more in the first eight months of 1937, than would have been spent under the rate of buying in 1929. This would indicate that the railroads are still behind in their buying for maintenance by approximately $697,000,000.

Mexican Railways' Traffic at Peak

(*Continued from page 44*)

and platforms, and electric indicators showing the location of the trains enroute, and were opened to the public on September 11. The old Colonia station has since been abandoned, and it is intended to construct a public park on the site. The cost of reconstructing the Buenavista station buildings amounted to $1,020,622 and the track changes cost $151,427. A C. T. C. installation from Buenavista to Lecheria, 35 kilometers, has been improved during the year at an additional cost of $252,500.

New station facilities, including new freight warehouses, were completed at the port of Tampico during the year at a total cost of $541,623. In co-operation with the reforestation program of the government, hundreds of thousands of trees were planted along the right of way, in the hope that this will eventually solve the tie problem. Gardens and parks have been constructed at a number of the more important stations, including Aguascalientes, Silao, Guanajuato, Patzcuaro, Celaya and others, for the purpose of encouraging tourist travel. The sum of $5,000,000 was approved by the board of directors for additions and betterments during 1937.

Indicative of the present trend of thought in Mexico is the "Sexennial Plan" for railway construction, a program that is fundamentally opposed to those formerly prevailing in that considerations of financial return are now practically disregarded. New construction is now viewed from a social angle, and the desire to connect large and rich sections of the country that have heretofore been isolated. With this policy in mind, the state has already provided $60,000,000 for railroad construction, two-thirds of which has been spent within the last two years. It is the government's aim to complete all lines now under construction by 1940. In prosecuting the program the socialistic and nationalistic tendencies in Mexico were further illustrated by the elimination of all contractors and the utilization direct of Mexican technicians and workers. A description of these new construction projects and their progress was given in the *Railway Age* of August 21, page 241.

Turning to the other railways of Mexico, especially the Southern Pacific line from Nogales down the west coast to Guadalajara, and the British-owned Mexican Railway operating between Mexico City and Vera Cruz, similar trends are evident. Traffic has increased on these lines throughout the year by reason of fairly good crops, increases in imports despite the increase in price of Mexican purchases abroad, and a marked growth in tourist travel.

Similarly, net earnings have been disappointing, because of the disproportionate increase in operating expenses for reasons beyond the managements' control, especially for higher wages and for increased cost of materials and supplies. These more than counteracted the favorable traffic situation, and increased the financial difficulties of the roads. All in all, 1937 was a year of rapid change in the Mexican railway picture.

* * *

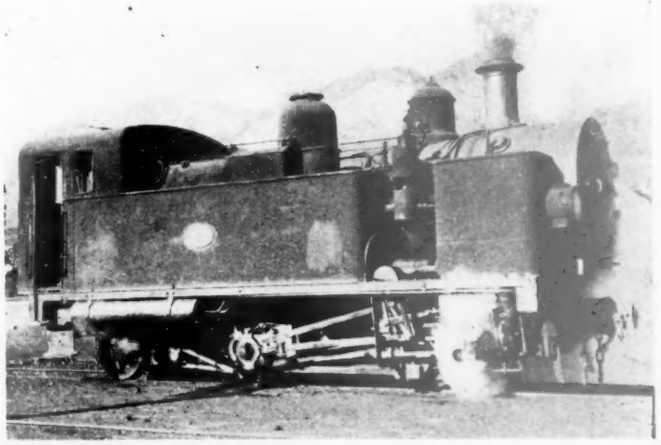
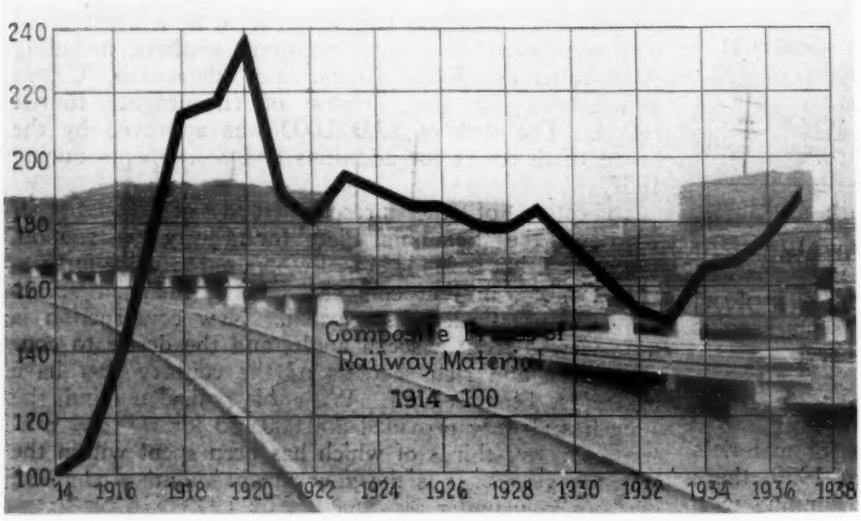


Photo by W. W. Stewart

Class H, "Fill" Type, Geared Locomotive for Service on the Rimutaka Incline of the New Zealand Railways

Cost of Railway Materials Higher In 1937



Trend of Year-Average Cost of Railway Materials, 1914-1937

Many prices above 1929—Carriers worried by effects on operating expenses and earnings

By D. A. Steel

Purchases and Stores Editor

SINCE this time last year, the railroads have paid higher prices for almost all of the materials and equipment they require, and the effect of these increases has been to give railway material costs a prominence which they have not had in many years. Most prices were raised to new levels by a flood of business and labor unrest which swept the country a year ago, and, with the principal exception of lumber and non-ferrous materials, the prices either remained unchanged as the tide of business receded, or, as in the case of coal, were subsequently increased by new rules from Washington.

Coal Up 11 Per Cent—Steel 15 Per Cent

Fourteen roads, mostly in the west, paid less at the mine last year for their locomotive coal, while the remainder paid from 1 to 10 cents per ton more at the mine, according to their reports to the I.C.C.; and the average was a 5 per cent increase at the mine and a 2 per cent increase, with freight and handling charges. The result was to raise the all-year average prices of locomotive coal at the mine 17 per cent over 1933, and the average cost of delivered coal 23 per cent over 1933, and to bring the costs of coal at the mine within 8 per cent of the 1929 average. Coal at the mine in October, at $1.94 per ton, was 20 cents higher than in January, 11 per cent over October, 1936, and 28 per cent over the 1933 average.

Twelve roads reporting to the *Railway Age* paid from 6 to 25 per cent more in 1937 than in 1936 for fuel oil, and the average price of 96 cents a bbl. for 10 months, as reported to the I. C. C., was 12 per cent above that for 1936, 65 per cent over 1933, and within 1 per cent of the 1929 figure. Gasoline, at 9.04 cents per gal., to all roads for ten months, averaged 3 per cent higher in 1936 and 17 per cent over 1933, but was 15 per cent under 1929.

Crosstie prices, reported to this paper by 14 railroads, averaged 13 per cent over 1936, 30 per cent over 1933 and 5 per cent over 1929, while lumber averaged 9 per cent over 1936, 102 per cent over the 1932 average and equaled the 1929 average.

Rail at $39 per ton last January and $42.50 after April 1, without extras, as compared with $36.375 throughout 1936, was 13 per cent higher than in 1936, 7 per cent above 1933, and within 4 per cent of 1929. The prices paid for 28 other products of iron and steel by 13 roads reporting to the *Railway Age* averaged 15 per cent over the average for the year 1936, 28 per cent over the average for 1932 or 1933 (whichever was lower) and 7 per cent over the average for 1929.

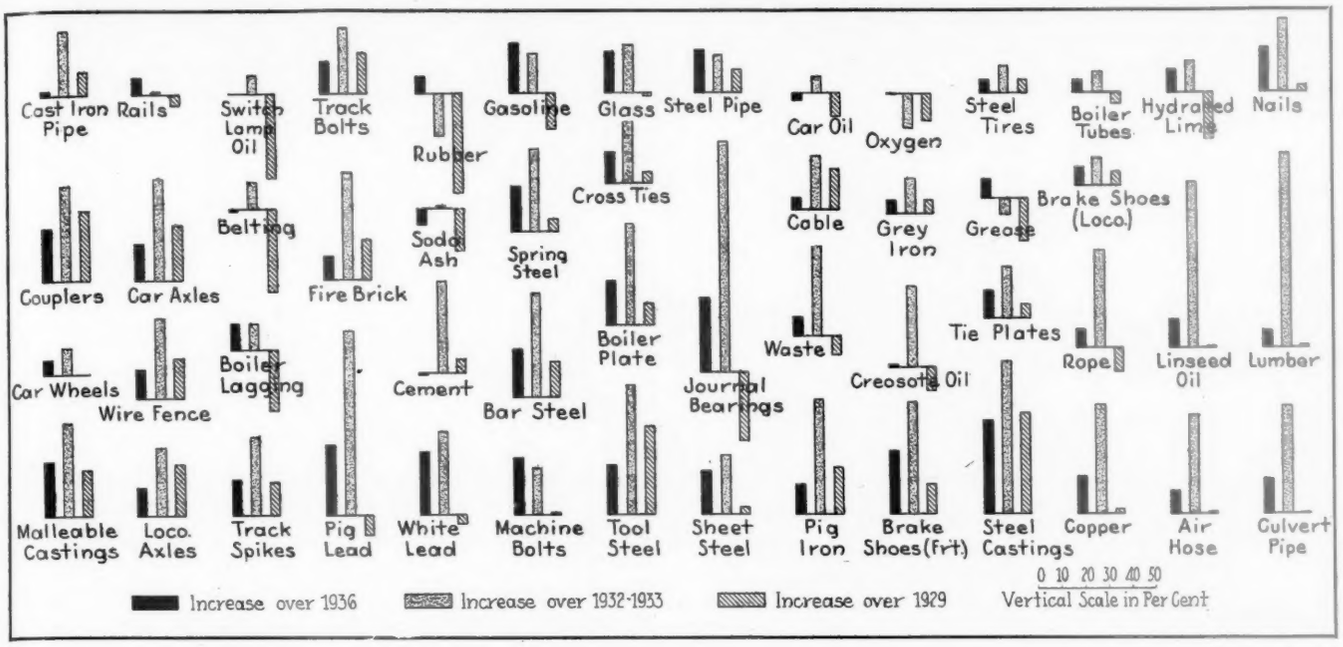
Miscellaneous items, including lubricating oils and greases, chemicals and building materials, averaged 8 per cent over 1936, 31 per cent over this paper's 1932-1933 average, and 9 per cent under 1929. Equipment prices appear to have averaged 10 per cent higher. For the first time in many years, several roads reported increased prices for locomotive and car specialties.

This paper's all-year weighted average price of coal and 65 other materials and supplies was 11 per cent over 1936, 32 per cent over the all-year average for 1932 or 1933, and 1 per cent over 1929. This does not include railroad scrap which, while declining severely during the last six months, averaged 17 per cent over 1936, 200 per cent over 1932 and 10 per cent over 1929.

The figures in general put fuel oil prices on a par with those prevailing in 1928, lumber and tie prices back to 1930, scrap prices back to 1925 and 1926, and some iron and steel prices back to 1924 and 1925, when expenditures for materials and supplies were twice those in 1937.

Costs Up $105,000,000

Since these figures represent all-year averages instead of maximum differences between the lowest values during the depression and the highest values in 1937, many of which were reached last October, they may understate the ultimate effect of the increases in prices



How the Average Costs of Railway Materials in 1937 Compared With Their Average Costs in 1936, 1932 or 1933 (whichever was lower) and in 1929—All Charts Drawn to the Same Scale

on railway operating expenses. Basing coal calculations on the prices in October (the last figures available) and other calculations on year averages, the conclusion is reached that the annual expenditures of the railroads for materials, fuel and equipment were increased approximately $105,000,000 by the increases in material costs in 1937, and that the materials and equipment purchased by them in 1937 cost approximately $235,000,000 more than the same purchases would have cost in 1932 or 1933, and that they cost about $5,000,000 more than they would have cost in 1929. Putting it another way, the railroads would have been able to buy approximately $105,000,000 more materials and equipment if prices had not risen above those of 1936, and approximately $235,000,000 more than if prices had not been increased since 1933.

As shown in one of the tables, the annual increase in the cost of coal, based on the latest coal prices, is $13,000,000 over 1936 and $33,000,000 over 1933; and the increase in fuel oil is $7,000,000 over 1936 and $26,000,000 over 1933. Other calculations based on year averages show that the costs of ties were increased $7,000,000 over 1936 and $14,000,000 over 1932; lumber costs, $3,500,000 over 1936 and $20,200,000 over 1932; rail and other iron and steel, $45,200,000 over 1936 and $69,000,000 over 1933; and miscellaneous purchases, $17,000,000 over 1936 and $53,000,000 over 1933. The cost of the equipment purchased was increased about $13,000,000 over 1936 and $19,000,000 over 1933.

Railroads report that they received what they bargained for last year, but deliveries were slow during the first six months. Competitive prices were fewer, despite the scramble for railway orders, and the gaps between base prices and actual costs were widened with the introduction of more "extras" for deviations from standard lots and grades, and by the withdrawal of freight and other allowances.

1938 Outlook For Prices

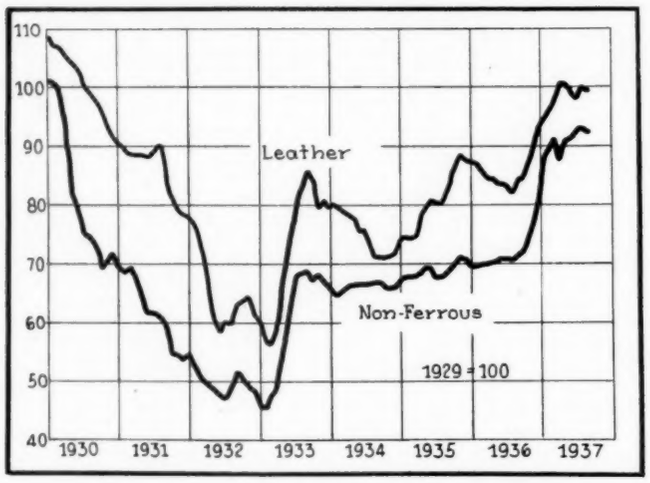
The present year begins with reductions in the prices of lumber, ties and non-ferrous metals. The National Coal Commission, created by the Guffy bill, recently announced minimum prices of coal, almost all of which are higher than the prices which the railroads have been paying, and some roads have contracted for fuel oil at 10 per cent more per bbl. The prices of iron and steel that prevailed during the last quarter of 1937 have been reaffirmed for the first quarter of this year, subject to increases in freight rates, but iron ore and scrap iron from which steel is made are lower. If busi-

Estimated Effect Of Increased Material Costs On Railway Expenses

	Estimated purchases excl. frt. (000)	Index† 1937 prices, 1936 = 100	Increased cost over 1936 (000)	Index† 1937 prices, 1933 = 100	Increased cost over 1933 (000)
Coal	$175,000	108‡	$13,000	123‡	$33,000
Fuel oil ...	66,000	112	7,000	165	26,000
Gasoline .	5,000	104	200	117	800
Ties	60,000	113	7,000	130	14,000
Lumber ..	40,000	109	3,500	202	20,200
Rail	45,000	113	5,200	107	3,000
Other iron and steel	300,000	115	40,000	128	66,000
Miscellaneous .	225,000	108	17,000	131	53,000
Total materials	916,000	111	92,900	132	216,000
New equipment ...	140,000	110	13,000	115	19,000
Total $1,056,000		...	$105,900	...	$235,000

† Year average.

‡ Based on October average.



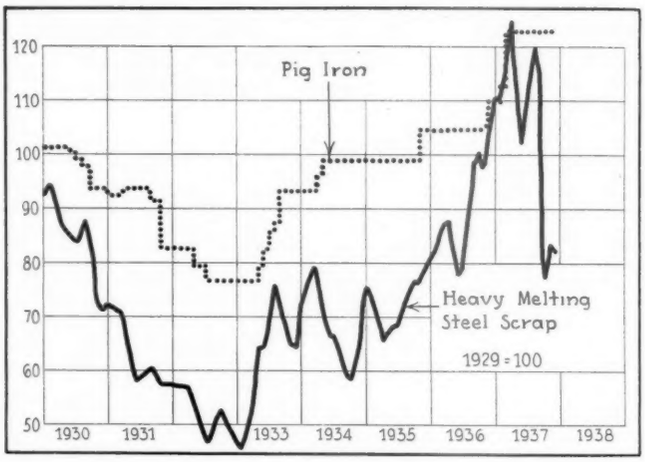
Fluctuations in Prices of Raw Materials, 1929-1937

ness picks up, prices may work higher, at least to the extent of the increases in freight rates which were allowed last November or in prospect, because costs of production are higher. If business languishes, there will be more declines. Opinion among railroad buyers is that downward adjustments will occur.

Railroads Fight Coal Costs

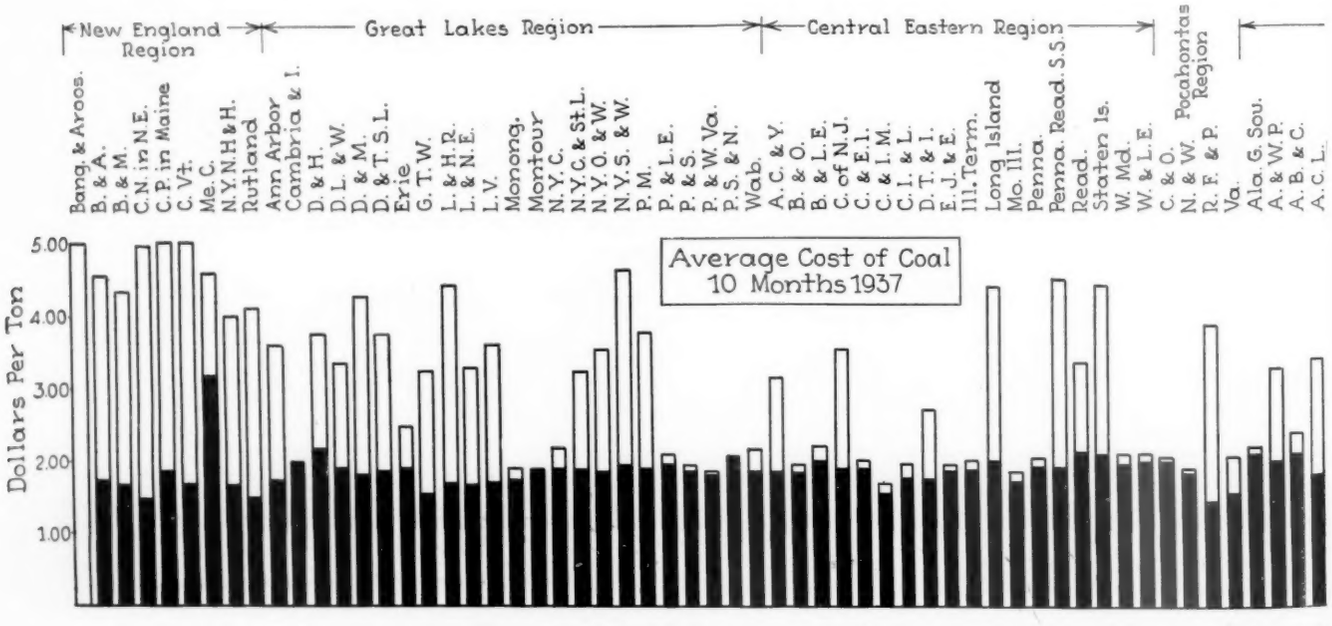
A year ago, coal producers tried to increase their prices from 1 cent to 3 cents a ton to take care of the Social Security tax. A temporarily disturbing problem also arose when unseasonable floods in the Ohio and Mississippi valleys last February watered mines and disrupted the movement of southern coal. Most important among developments in coal, however, were the new wage agreements and the National Bituminous Coal act. The wage negotiations were carried on during the C. I. O. trouble in Detroit, and when concluded March 31, to avert impending strikes in the coal industry, they established for a period of two years, ending April 1, 1939, a 35-hour week and a scale of wages which are now 100 per cent above the depression low for some labor, and which caused increases in costs of production of 15 to 25 cents per ton.

The coal bill, which became a law April 26, is a reincarnation of the Guffy bill of 1936, except as to the labor provisions which were invalidated by the Supreme Court. The bill revives the coal codes, compels membership by levying a tax of 19½ per cent on nonmembers, and aims to regulate prices and trade practices as a cure of the industry's troubles. Last year, a National Coal Commission, composed of five members selected by the President, was formed and code authorities were organized to determine the average costs of producing coal in each district, as the basis for prices. In December, after months of controversy, delay and dissension, minimum prices were announced and the government is now faced with opposition to the new prices by large consumers, including the railroads, which have estimated that the new prices will increase railroad coal costs by more than $19,000,000. The outcome remains to be seen, also the extent to which the act may control the price of coal from mines owned by the railroads. In the meantime, some railroads have bought slack coal for power plants at prices as low as 50 cents a ton, which is far below the cost of production of this by-product from coal produced for the commercial trade.



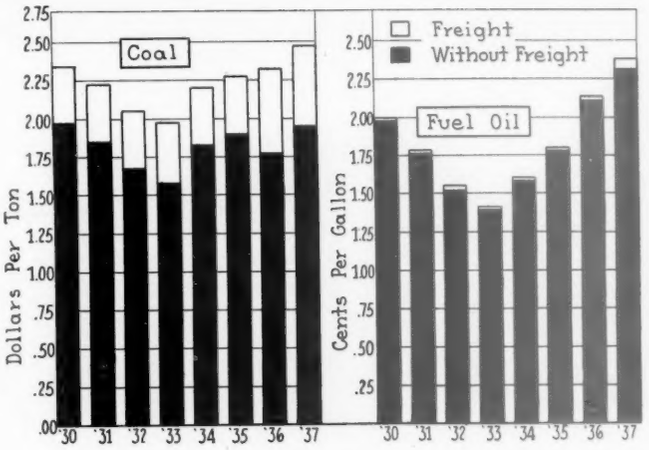
Comparative Changes in Pig Iron and Scrap Prices, 1929-1937

In purchasing fuel oil, the railroads are confronted



Average Cost of Coal Per Ton to Railroads, With and Without Freight—10 Months, 1937

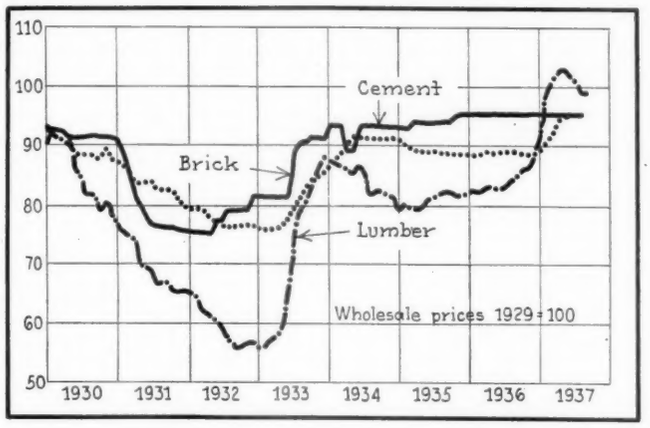
with more intelligent co-operation between the states to keep the production of crude oil from running wild; and the diminishing amount of fuel oil per barrel of crude that is produced under present day refining processes. Prices to the railroads were more standardized than in previous years and seasonal fluctuations were narrowed. Each year sees more crude oil produced, however, to supply the gasoline requirements, and while some roads content themselves with a low grade of fuel oil, the fear of a restricted supply for railroad use is not acute, and leaves the railroads near the oil fields relatively free to depend on buying spot purchases at bargain prices to fill a part of their requirements, instead of purchasing all of their oil at the contract prices. Several roads obtained their supply last year at prices which averaged below 75 cents per barrel.



Year-Average Costs of Coal and Fuel Oil for Locomotives

Iron and Steel Prices Soar

The increases in iron and steel prices last year were outstanding, both because they were the largest increases made in railway costs and because iron and steel prices usually change but little. In the space of two years, tie plates advanced from $38 a ton to $46, an increase of 20 per cent. Track bolts have increased from $3.83 a cwt. in January, 1936, to $4.63, or 21 per cent. Track chisels at $2.06 each are now 22 per cent higher than last January. Several roads are paying 30 per cent more for track spikes than two years ago. Wire fencing that cost 47.7 cents a rod two years ago is now costing 58 cents, an increase of 22 per cent. A

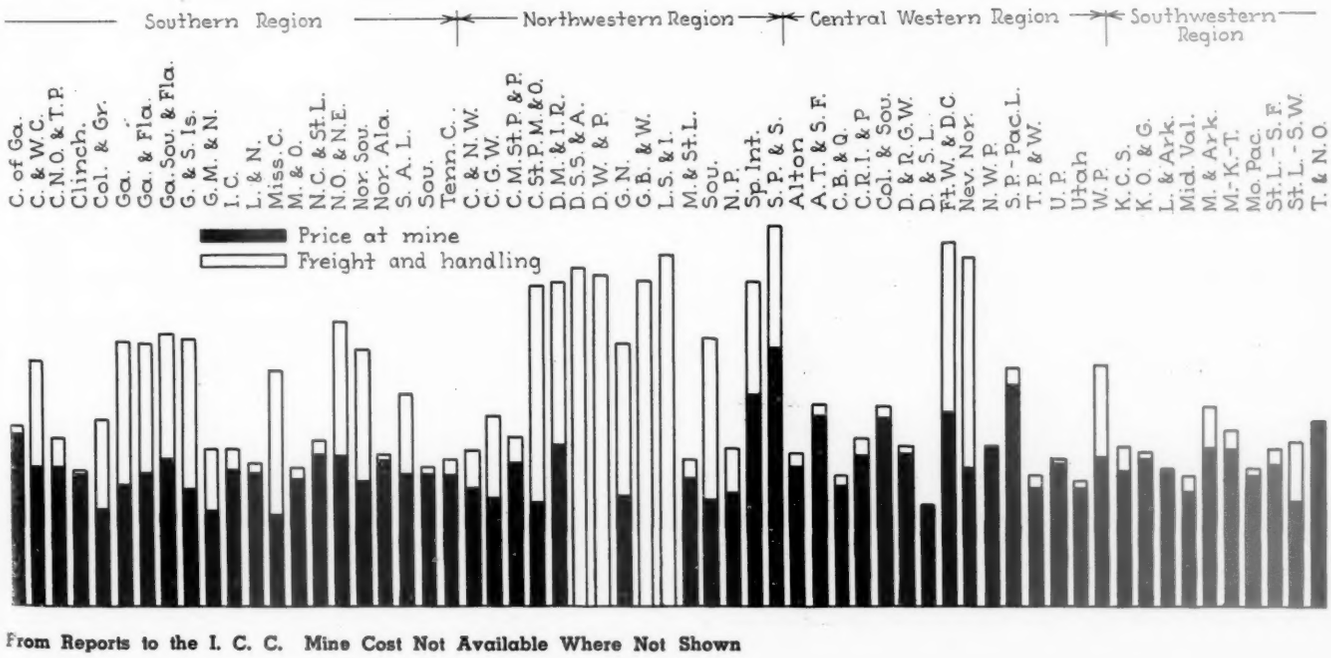


Trend of Building Material Prices, 1929-1937

Cost of Fuel for Locomotives

	Coal Per Net Ton		Fuel Oil Per Bbl.	
	Incl. frt.	Excl. frt.	Incl. frt.	Excl. frt.
1925	$2.72	...	$1.32	...
1926	2.63	...	1.24	...
1927	2.66	$2.21	1.18	$1.14
1928	2.53	2.12	1.04	1.01
1929	2.40	2.01	.89	.86
1930	2.34	1.95	.84	.82
1931	2.21	1.84	.74	.73
1932	2.05	1.66	.65	.63
1933	1.96	1.58	.59	.58
1934	2.20	1.83	.68	.67
1935	2.27	1.89	.76	.80
1936 Jan.	2.37	1.79	.81	.81
June	2.36	1.80	.86	.86
Sept.	2.32	1.79	.91	.87
9 mos.	2.36	1.79	.85	.85
1937 Jan.	2.32	1.79	.92	.92
June	2.47	1.95	.98	.98
Sept.	2.48	1.94	1.00	.97
9 mos.	2.41	1.87	.97	.96

Source—I. C. C.



From Reports to the I. C. C. Mine Cost Not Available Where Not Shown

Average Unit Costs of Railroad Materials—1927-1937*

Description	Unit	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937 First quarter	1937 Mid-year	1937 Last quarter	1937 High	1937 Low	1937 Average	Per cent of 1936	Per cent of 1933†
Track Materials																			
Rail	N.t.	$43.00	$43.00	$43.00	$43.00	$43.00	$42.00	$38.79	$36.37	$36.37	$36.375	$39.00	$42.50	$42.50	$42.50	$39.00	$41.33	113	107
Tie plates—Steel	N.t.	45.98	42.43	42.10	41.22	38.88	36.40	36.64	39.56	38.73	39.91	42.75	46.02	46.02	48.87	38.00	44.93	112	122
Track bolts—Heat-treated with nuts	Cwt.	4.00	3.83	3.75	3.94	3.74	3.42	3.52	3.71	3.71	3.87	4.21	4.47	4.47	4.77	3.75	4.40	114	128
Track chisels—Alloy steel	Ea.	1.96	1.76	1.74	1.71	1.64	1.64	1.70	1.71	1.79	1.69	1.87	1.97	2.05	2.80	1.64	1.96	116	119
Track spikes—High-carbon steel	Cwt.	2.80	2.76	2.71	2.68	2.57	2.45	2.32	2.46	2.46	2.68	2.96	3.15	3.15	3.25	2.90	3.09	115	133
Track shovels—No. 2 carbon steel	Doz.	12.95	13.82	11.28	10.02	9.98	10.93	11.53	13.20	13.26	12.70	12.70	12.93	13.43	17.93	11.35	13.02	103	120
Bond wire—35-48 in. cop. clad	Cwt.	14.78	17.50	18.56	17.69	15.89	14.48	14.99	16.27	16.33	15.06	17.89	19.35	19.40	20.85	13.16	18.88	125	130
Wire fence—26-49 in. woven	Rod	.467	.488	.426	.428	.396	.383	.370	.402	.416	.403	.465	.523	.520	.627	.258	.502	124	135
Steel, structural—Angles	Cwt.b.	1.98	1.98	2.35	1.98	1.84	1.73	1.75	1.93	1.96	2.19	2.35	2.54	2.54	4.00	2.05	2.48	113	142
Pipe, cast-iron—12 in. Class B	N.t.	41.13	41.13	39.41	40.37	35.58	33.94	37.91	40.80	40.60	42.25	40.57	43.83	44.57	57.00	18.80	42.99	102	128
Pipe, culvert—24 in. corr.	Ft.	....	....	....	....	....	1.95	1.74	2.02	2.16	2.19	2.47	2.53	2.60	3.40	1.54	2.54	115	146
Brick—Common	M	....	....	....	....	....	....	....	....	....	....	12.53	12.69	12.94	20.00	8.50	12.72	103	...
Ballast—Crushed rock	C.y.	....	....	....	....	....	....	....	....	....	....	1.05	1.05	1.05	1.65	.75	1.05	105	115
Locomotive and Car Materials																			
Bolts, with nuts—¾x6, machine	100 pcs.	5.13	5.02	4.87	4.81	4.20	4.04	4.70	4.59	4.08	3.97	4.64	5.11	5.05	6.28	4.20	4.93	124	120
Boiler tubes—2 in. No. 11 gage steel	Ft.	.172	.172	.174	.154	.152	.152	.156	.161	.161	.158	.169	.169	.169	.176	.152	.166	105	106
Bar steel—Open-hearth	Cwt.b.	2.13	2.58	2.17	1.85	1.80	1.72	1.73	1.84	2.01	2.09	2.33	2.57	2.57	2.70	2.20	2.49	120	144
Steel—High-speed tool	Lb.b.	.59	.58	.57	.66	.52	.49	.52	.60	.61	.64	.70	.76	.87	1.23	.60	.78	121	159
Steel—Boiler	Cwt.b.	2.01	2.00	2.33	2.01	1.86	1.73	1.82	2.10	2.05	2.12	2.41	2.59	2.59	3.59	2.10	2.53	119	146
Steel—Spring	Cwt.b.	2.74	2.63	2.84	2.62	2.42	2.18	2.23	2.31	2.36	2.54	2.90	3.10	3.11	3.75	2.40	3.03	119	138
Steel—24-gage black	Cwt.	3.20	2.99	3.25	2.90	2.65	2.69	2.68	2.72	2.81	2.82	3.04	3.40	3.40	4.75	2.50	3.28	117	125
Pig iron—No. 1	G.t.	20.50	20.50	17.35	16.61	15.37	14.85	15.74	18.30	18.59	19.47	19.80	23.30	23.30	24.60	18.50	22.13	113	149
Brake shoes—Loco. driving	N.t.	61.70	61.70	59.54	60.00	56.53	54.28	54.50	56.30	56.65	56.65	59.54	62.10	62.45	69.00	57.00	61.36	108	112
Brake shoes—Freight car	N.t.	36.93	39.98	37.55	35.42	35.12	32.70	33.40	35.00	36.00	37.77	46.40	49.00	49.40	52.00	45.00	48.27	128	148
Castings, grey iron—Green sand	Cwt.	3.86	3.97	4.12	4.12	4.00	3.82	3.82	3.90	3.87	4.14	4.14	4.31	4.31	5.00	3.45	4.25	103	115
Castings, malleable—7-15 lb., 25-100	Cwt.	9.13	8.50	8.68	8.27	7.68	7.59	7.42	8.99	8.29	8.42	9.45	10.84	10.84	12.50	5.75	10.38	123	140
Castings, steel—25-50 lb., under 50	Cwt.	8.64	7.97	8.32	8.46	7.73	7.37	7.25	8.52	8.49	8.52	10.73	12.28	12.72	12.90	11.00	11.91	140	165
Couplers, car—5x7x6½ AAR-E	Pr.	41.20	40.20	40.20	41.20	39.20	38.13	37.20	40.20	40.20	42.43	48.07	53.52	53.52	59.20	46.50	51.70	122	140
Wheels, car—33 in. chilled iron	Cwt.	....	....	....	....	....	....	1.35	1.40	1.40	1.40	1.40	1.55	1.55	1.55	1.40	1.50	107	111
Wheels, car, steel—33 in. tender 800-lb.	Ea.	....	....	....	....	....	....	....	....	....	....	28.25	31.32	31.52	46.25	16.25	30.60	110	115
Axles, loco.—Driving, carbon	Cwt.	5.16	5.21	4.84	4.29	4.75	4.55	4.56	4.90	5.06	5.26	5.83	6.00	6.00	7.22	5.10	5.94	112	129
Axles, car—5x9, rough turned	Cwt.	2.94	2.94	2.94	2.88	2.88	2.75	2.53	2.89	2.98	3.09	3.50	3.67	3.67	4.45	3.15	3.61	117	143
Tires, frt. loco.—33 in., rough bored	Cwt.	6.11	6.11	5.84	6.22	6.03	5.86	5.55	5.67	5.97	5.83	6.03	6.30	6.30	6.90	5.85	6.21	106	112
Pipe—1 in. black steel	Ft.	.076	.069	.066	.067	.069	.063	.063	.066	.069	.062	.068	.075	.075	.108	.052	.073	118	116
Wire nails—Common	Cwt.b.	2.58	2.62	2.62	2.29	2.07	2.18	2.23	2.62	2.83	2.28	2.46	2.87	2.81	3.15	2.25	2.71	119	131
Pig lead—Virgin	Cwt.	7.04	6.43	6.95	5.64	4.42	3.53	4.17	4.04	4.44	4.87	6.44	6.40	6.17	8.00	5.70	6.34	130	179
Copper—Sheet, soft	Lb.	.218	.23	.27	.259	.181	.180	.169	.180	.211	.212	.242	.261	.245	.279	.190	.252	119	146
Journal bearings—AAR	Lb.	.142	.141	.167	.149	.10	.07	.081	.093	.096	.106	.129	.149	.141	.153	.123	.139	132	198
Wire, copper—No. 9 bare	Lb.	.149	.167	.195	.163	.115	.100	.113	.138	.141	.142	.187	.200	.169	.203	.170	.185	130	185
Miscellaneous																			
Boiler lagging—1¼x6x36 mag.	Sq. ft.	.21	.22	.236	.160	.155	.156	.156	.157	.160	.154	.172	.188	.189	.205	.152	.183	111	111
Fire brick—Soft	M	41.74	43.08	41.73	41.85	39.29	34.70	37.20	44.58	45.26	45.64	47.76	51.66	51.82	72.65	40.00	50.42	110	146
Hose—Airbrake 1¾x22	Ft.	.48	.46	.44	.45	.37	.33	.31	.39	.41	.40	.44	.44	.44	.68	.36	.44	110	142
Leather—Belting, 6 in. double	Ft.	1.22	1.35	1.39	1.39	1.23	1.27	1.17	1.32	1.31	1.32	1.30	1.30	1.31	1.82	.72	1.30	99	111
Rope—¾ in. manila	Lb.	.217	.199	.199	.189	.153	.142	.127	.142	.130	.167	.173	.185	.184	.209	.145	.180	108	142
Cable—¾ in. 6x19 steel	Ft.	.125	.119	.144	.14	.143	.132	.137	.155	.161	.161	.166	.175	.180	.226	.121	.174	108	123
Rubber, red—⅛ in. sheet packing	Lb.	.32	.28	.247	.25	.225	.176	.172	.177	.167	.131	.139	.140	.144	.200	.095	.141	107	82
Gasoline—Plus tax	Gal.	.116	.109	.109	.102	.082	.084	.078	.086	.085	.089	.092	.093	.091	.137	.043	.092	103	117
Oil—Switch lamp—tanks	Gal.	.096	.09	.087	.117	.062	.061	.051	.053	.052	.055	.054	.056	.056	.082	.037	.055	100	108
Oil—Car—tank lots	Gal.	.180	.157	.157	.163	.138	.127	.134	.135	.132	.141	.133	.131	.133	.170	.108	.132	97	107
Grease—Driving box	Lb.	.160	.122	.125	.131	.122	.118	.109	.104	.103	.102	.101	.101	.101	.110	.092	.101	108	93
Waste—Colored cotton	Lb.	.098	.091	.086	.084	.076	.051	.057	.065	.057	.073	.086	.078	.075	.159	.055	.079	108	138
Creosote oil—Tank lots	Gal.	.157	.157	.145	.130	.115	.108	.093	.106	.116	.109	.121	.124	.125	.140	.100	.123	101	135
Glass—24x24 dsa	Box	5.23	5.10	5.76	5.84	4.80	4.71	5.18	4.59	5.03	4.81	5.68	5.62	5.51	6.87	4.59	5.60	116	120
Linseed oil—Boiled	Lb.	.088	.093	.117	.120	.09	.068	.087	.095	.103	.104	.112	.120	.121	.155	.095	.117	112	170
White lead—In oil—100 lb. keg	Lb.	.11	.102	.104	.106	.107	.088	.08	.081	.085	.085	.098	.104	.100	.115	.083	.100	127	135
Cement, Portland—In paper	Bbl.	2.21	1.85	1.87	1.76	1.42	1.42	1.80	1.95	2.16	2.02	1.98	1.98	1.98	2.40	1.75	1.98	99	139
Soda ash—Water softening	Cwt.	1.33	1.40	1.46	1.56	1.55	1.30	1.21	1.31	1.32	1.30	1.20	1.20	1.20	2.50	.80	1.20	93	100
Hydrated lime—Water softening	N.t.	13.63	11.99	11.96	9.73	9.53	9.49	8.35	8.50	8.48	8.59	9.31	9.37	9.71	16.00	6.25	9.47	111	113
Oxygen	100 cu.ft.	1.29	1.04	1.03	1.05	1.06	1.02	1.04	1.10	1.06	.94	.91	.91	.91	1.10	.60	.91	100	87
Incandescent lamps	Ea.	....	....	....	....	....	....	....	....	....	....	.162	.162	.158	.29	.122	.161	...	...
Forest Products																			
Lumber, fir—1x6x9 B&B siding	M ft.	....	....	....	....	....	18.76	25.14	31.40	32.10	32.50	31.50	37.00	34.00	38.00	25.00	34.16	106	183
Lumber, pine—1x6x9 B&B siding	M ft.	....	....	....	....	....	....	....	....	....	....	44.36	49.25	47.71	54.50	40.00	47.11	110	160
Lumber, fir—2x6x18 B&B sheath.	M ft.	....	....	....	....	....	21.83	36.75	45.00	37.29	47.22	47.17	47.60	44.40	60.00	20.00	46.39	100	210
Lumber, fir—6x6 com. rgh. sill	M ft.	....	....	....	....	....	10.23	13.00	19.00	17.98	20.20	23.80	24.60	23.50	28.00	20.00	23.96	118	230
Br. stringers, fir—16"x32' or less	M ft.	....	....	....	....	....	12.52	15.70	23.50	21.15	20.69	22.14	23.93	23.64	30.00	16.50	23.23	112	187
Crossties—Fir, 7x9x8'6	Ea.	.60	.60	.67	.80	.50	.50	.49	.53	.49	.53	.55	.63	.65	.68	.50	.61	115	125
Crossties—Pine, 7x9x8'6	Ea.	.67	.67	.67	.77	.65	.73	.64	.62	.57	.72	.74	.77	.77	1.00	.42	.77	107	120
Crossties—White oak, 7x9x8'6	Ea.	.98	.95	.93	.92	.83	.75	.69	.69	.67	.82	.93	.99	.96	1.25	.53	.96	116	139
Railroad Scrap (Sold)																			
No. 1 wrought	N.t.	11.16	11.39	11.96	8.68	7.20	4.20	6.65	7.96	9.07	12.20	14.38	13.77	13.47	16.50	12.00	13.87	113	320
No. 1 heavy melt	N.t.	11.63	11.34	12.82	10.62	7.33	5.34	7.32	8.55	9.29	12.32	15.48	14.48	13.37	17.50	11.65	14.44	117	270
Rails for re-rolling	N.t.	13.80	12.92	14.49	12.55	10.05	7.18	8.10	9.22	9.89	13.21	16.73	16.44	14.75	20.09	12.50	15.97	121	221

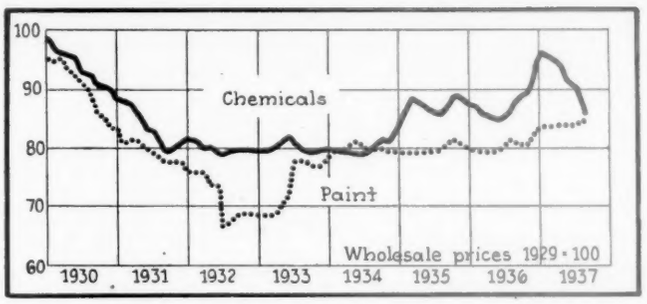
* Compiled from special reports made by railroads to the *Railway Age* by selected railroads.
† 1932 or 1933 whichever was lower.

$10 a ton increase in cast iron pipe was a 26 per cent rise in two years.

In two years, machine bolts have risen $20 a ton, or 25 per cent; bar steel, $10 a ton, or 24 per cent; tool steel, 45 per cent; boiler plate, $10 a ton, or 26 per cent. Brake shoes have advanced $3 a ton, or 10 per cent; grey iron castings, $10 a ton, or 10 per cent; malleable castings, $46 a ton, or 29 per cent; while car wheels were advanced 10 per cent last year. In the same period, axles and tires, which have remained stationary for many years, were increased $10 a ton, while steel pipe and nails are up 18 per cent.

The average costs of tracks bolts, track spikes, wire fence, structural steel, cast iron pipe, bar and sheet steel, pig iron, brake shoes, castings, couplers, axles, tires and steel pipe are all higher than in 1929.

Scrap iron, which the railroads sell in large quantities, has declined precipitously since March, when the prices were the highest since 1925, but the average price of $14.44 a ton, at which 13 railroads sold the heavy melting steel last year, was 17 per cent more than the 1936 average and two or three times the price which the roads got in 1933. The increased cost of scrap iron to producers of steel was among the things which caused the mills to raise their manufactured prices; at the same time, it injected a compensating factor in the prices paid by the railroads, as will appear when it is considered that the railroads produce approximately 20 per cent of all the commercial scrap.



Index Prices of Chemicals and Paints, 1929-1937

Lumber prices fluctuated as much as $10 per MBM last year. To begin with, a marine strike on the Pacific Coast which began October 29, 1936, forced many of the water mills to suspend operations until it was settled on February 5, 1937. This greatly increased the

Average Cost of Coal Per Ton—10 Months, 1937

Region and Road	With Freight 1937	With Freight 1936	Without Freight 1937	Without Freight 1936
New England Region:				
Bangor & Aroostook	$5.01	$5.10	...	$1.59
Boston & Albany	4.57	4.52	$1.76	1.73
Boston & Maine	4.37	4.45	1.70	1.64
Canadian National (In New Eng.)	4.99	4.92	1.49	1.32
Canadian Pacific (In Maine)	5.04	5.04	1.72	1.73
Canadian Pacific (In Vermont)	5.08	5.06	1.80	1.72
Central Vermont	5.02	4.89	1.71	1.50
Maine Central	4.58	4.74	3.19	3.05
New York, New Haven & Hartford	4.00	4.02	1.67	1.60
Rutland	4.12	4.15	1.51	1.44
Great Lakes Region:				
Ann Arbor	3.64	3.55	1.74	1.66
Cambria & Indiana	...	...	2.06	1.93
Delaware & Hudson	3.74	3.77	2.18	2.06
Delaware, Lackawanna & Western	3.32	3.42	1.89	1.83
Detroit & Mackinac	4.27	4.25	1.82	1.65
Detroit & Toledo Shore Line	3.68	3.82	1.78	1.75
Erie (Inc. Chicago & Erie)	2.51	2.37	1.92	1.82
Grand Trunk Western	3.27	3.35	1.57	1.53
Lehigh & Hudson River	4.34	4.30	1.71	1.62
Lehigh & New England	3.28	3.44	1.69	1.70
Lehigh Valley	3.60	3.59	1.72	1.65
Monongahela	1.88	1.80	1.74	1.65
Montour	1.95	1.90	1.96	1.84
New Jersey & New York	4.89	4.94	1.91	1.86
New York Central	2.20	2.11	1.89	1.78
New York, Chicago & St. Louis	3.26	3.22	1.90	1.76
New York, Ontario & Western	3.55	3.50	1.84	1.81
New York, Susquehanna & Western	4.62	4.69	1.95	1.86
Pere Marquette	3.79	3.77	1.90	1.79
Pittsburgh & Lake Erie	2.11	1.98	1.96	1.82
Pittsburg & Shawmut	1.93	1.87	1.86	1.81
Pittsburgh & West Virginia	1.86	1.76	1.82	1.68
Pittsburg, Shawmut & Northern	2.05	1.91	2.06	1.91
Wabash	2.20	2.12	1.85	1.75
Central Eastern Region:				
Akron, Canton & Youngstown	3.16	3.00	1.84	1.69
Baltimore & Ohio	1.94	1.85	1.85	1.77
Bessemer & Lake Erie	2.19	2.09	2.00	1.87
Central of New Jersey	3.59	3.47	1.88	1.73
Chicago & Eastern Illinois	2.02	1.93	1.90	1.83
Chicago & Illinois Midland	1.70	1.82	1.57	1.68
Chicago, Indianapolis & Louisville	1.97	1.89	1.79	1.72
Detroit, Toledo & Ironton	2.77	2.71	1.77	1.73
Elgin, Joliet & Eastern	1.99	1.91	1.86	1.70
Illinois Terminal	2.00	1.95	1.89	1.86
Long Island	4.42	4.42	2.02	1.91
Missouri-Illinois	1.83	1.81	1.72	1.75
Pennsylvania system	2.04	1.96	1.94	1.83
Penna.-Read. Seashore Lines	4.54	4.54	1.91	1.79
Reading	3.35	3.25	2.12	1.97
Staten Island Rapid Transit	4.43	4.51	2.09	1.98
Western Maryland	2.11	1.96	1.96	1.88
Wheeling & Lake Erie	2.10	1.98	2.01	1.90
Pocahontas Region:				
Chesapeake & Ohio	2.07	1.92	2.01	1.86
Norfolk & Western	1.89	1.79	1.84	1.73
Richmond, Fredericksburg & Potomac	3.90	3.83	1.44	1.27
Virginian	2.04	1.85	1.57	1.43
Southern Region:				
Alabama Great Southern	2.20	2.10	2.13	2.02
Atlanta & West Point (Inc. Western Ry. of Alabama)	3.31	3.25	2.01	1.89
Atlanta, Birmingham & Coast	2.40	2.30	2.10	2.03
Atlantic Coast Line	3.42	3.37	1.80	1.70
Central of Georgia	2.47	2.41	2.36	2.27
Charleston & Western Carolina	$3.38	$3.31	$1.88	$1.74
Cin. New Orleans & Tex. Pac.	2.31	2.22	1.93	1.77
Clinchfield	1.84	1.74	1.76	1.65
Columbus & Greenville	2.54	2.56	1.33	1.18
Georgia	3.63	3.65	1.69	1.60
Georgia & Florida	3.60	3.55	1.82	1.73
Georgia, Southern & Florida	3.76	4.41	2.01	2.22
Gulf & Ship Island	3.66	3.65	1.59	1.47
Gulf, Mobile & Northern	2.15	2.16	1.30	1.26
Illinois Central Lines	2.15	2.06	1.85	1.73
Louisville & Nashville	1.94	1.87	1.79	1.72
Mississippi Central	3.22	3.28	1.27	1.23
Mobile & Ohio	1.91	2.09	1.72	2.02
Nashville, Chat. & St. Louis	2.27	2.27	2.09	1.92
New Orleans & Northeastern	3.88	3.86	2.07	1.95
Norfolk Southern	3.51	3.47	1.71	1.59
Northern Alabama	2.07	1.91	2.00	1.89
Seaboard Air Line	2.96	2.93	1.80	1.72
Southern	1.91	1.82	1.79	1.67
Tennessee Central	2.00	1.93	1.78	1.73
Northwestern Region:				
Chicago & North Western	2.15	1.90	1.62	1.45
Chicago Great Western	2.62	2.69	1.49	1.46
Chicago, Milw., St. P. & P.	2.33	2.22	1.98	1.89
Chicago, St. P., Minn. & Omaha	4.36	4.32	1.42	1.51
Duluth, Missabe & Iron Range	4.42	4.28	2.20	...
Duluth, South Shore & Atlantic	4.61	4.48	...	...
Duluth, Winnipeg & Pacific	4.55	4.31	...	...
Great Northern	3.63	3.53	1.47	1.47
Green Bay & Western	4.45	4.29	...	...
Lake Superior & Ishpeming	4.82	4.71	...	...
Minneapolis & St. Louis	2.03	2.15	1.75	1.81
Minn., St. P. & Sault Ste. Marie	3.69	3.66	1.44	1.39
Northern Pacific	2.14	2.07	1.55	1.52
Spokane International	4.40	4.22	2.89	2.91
Spokane, Portland & Seattle	5.24	...	3.57	2.53
Central Western Region:				
Alton	2.08	2.03	1.90	1.88
Atchison, Topeka & Santa Fe	2.79	2.79	2.63	2.62
Chicago, Burlington & Quincy	1.80	1.67	1.64	1.54
Chicago, Rock Island & Pacific (Incl. Chi. R. I. & Gulf)	2.34	2.33	2.07	2.05
Colorado & Southern	2.73	2.73	2.60	2.52
Denver & Rio Grande Western	2.17	2.05	2.10	1.96
Denver & Salt Lake	1.39	1.41	1.40	1.43
Ft. Worth & Denver City	5.03	4.90	2.66	2.55
Nevada Northern	4.83	4.84	1.86	1.79
Northwestern Pacific	...	...	2.21	2.20
Southern Pacific (Pacific Lines)	3.31	3.33	3.07	3.06
Toledo, Peoria & Western	1.78	1.62	1.61	1.55
Union Pacific	2.05	2.15	1.97	2.05
Utah	1.71	1.54	1.62	1.44
Western Pacific	3.34	3.32	2.03	2.00
Southwestern Region:				
Kansas City Southern	2.24	2.29	1.84	1.85
Kansas, Oklahoma & Gulf	2.11	2.18	2.07	2.07
Louisiana & Arkansas	...	...	1.91	1.78
Midland Valley	1.78	1.76	1.58	1.65
Missouri & Arkansas	2.79	2.74	2.18	2.15
Missouri-Kansas-Texas lines	2.49	2.70	2.17	2.33
Missouri Pacific	1.91	1.88	1.83	1.83
Oklahoma City-Ada-Atoka	2.59	2.67	...	...
St. Louis-San Francisco	2.13	2.09	1.96	1.93
St. Louis-San Francisco & Texas	...	...	1.78	1.80
St. Louis Southwestern	2.27	2.21	1.42	1.37
Texas & New Orleans	...	...	2.53	3.97

Source—I. C. C.

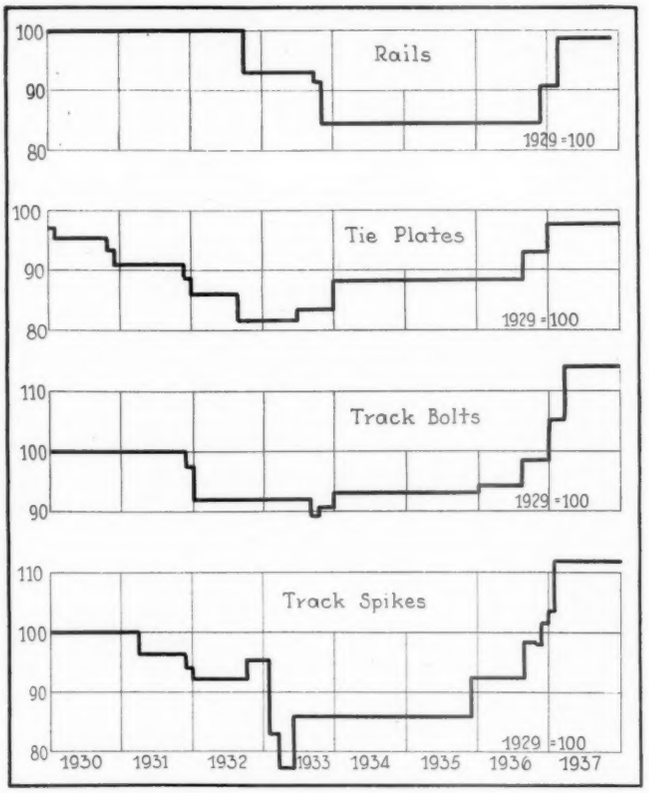
* Compiled from special reports made by railroads to the *Railway Age* by selected railroads.
† 1932 or 1933 whichever was lower.

demand for shipments by rail during that period, and the back log of unshipped orders on the coast was 890 million FBM in early February. Severe weather conditions also delayed the movement of lumber. Prices continued to rise until about June, after which the production of lumber each week exceeded the orders received so that the market prices have since declined $5 or more from the high point last year. Mill prices on railroad lumber on the West Coast in November, 1937, as compared with those prevailing in November, 1936, are shown in the table.

	November, 1936	November, 1937
Car siding	$28.00	$36.00
Car lining	25.00	28.00
Car decking	20.00	20.00
Car framing	18.00	20.00
Car sills	22.00	24.00
Car running boards	28.00	30.00
Bridge timbers	16.00	16.50
Bridge stringers	19.00	20.00
Bridge caps	25.00	25.00
Plank	12.00	12.00
Dimension	14.50	14.50

With ties, most railroads and tie contractors were compelled to offer better prices to stimulate production and expedite deliveries, especially among farmers who had other sources of income. This condition persisted until recently when the railroads again began to experiment with reduced prices for their 1938 ties. No. 5 ties in Pennsylvania cost $1.05 on January 1, 1937, $1.25 on April 1, and $1.05 after July 1. In New York, they cost $0.95 in January, $1.05 in April, and $1.00 after July 1. In Kentucky, they cost $0.65 in January, $0.85 on April 1, $0.75 on July 1, and $0.65 after November 1, while reductions of 5 to 8 cents per tie were made last year in Arkansas.

In British Columbia, where the Canadian roads obtain their supplies, the mills had enough orders for export business at the beginning of last year to run 90 to 120 days, and when they began operations in March, after two months' inaction caused by extreme cold, they had all the business they could handle for months; and this continued until fall when the war in China contributed to the general decline in the lumber trade. The prices of 1-in. by 4-in. by 8-ft. car siding increased from $27 per MBM in September, 1936, to $40 in March, 1937, and then declined to $23 in October. Prices of 2-in. by 6-in. by 9-ft. car lining changed from $38 in September, 1936, to $65 in March, 1937, and to $50 in October. Timbers that sold for $17 last year were $23 last spring and are now down to $14 to $16.



Comparative Fluctuations in Track Material Prices, 1927-1937

Other details and comparisons of prices will be found in the tables. The tables of commodity prices are based on average prices reported to the *Railway Age* by 13 large railroads in various parts of the country, and the figures given are the averages of the prices reported. The high and low figures do not represent the fluctuation in the price trend, but are inserted to show the highest and the lowest prices that were reported during the year by the several roads without regard to the period of the year in which they appeared.

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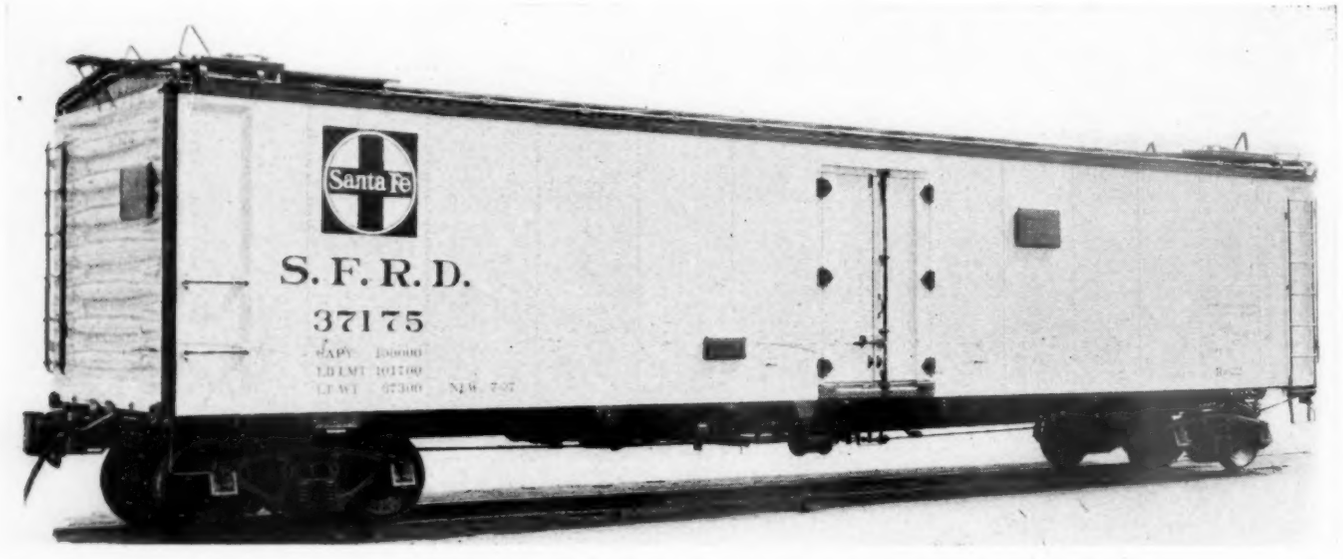


One of an Order of 50-Foot Steel Refrigerator Cars Built for the Santa Fe Refrigerator Despatch by the General American Transportation Corporation

Railway Construction Remains Low

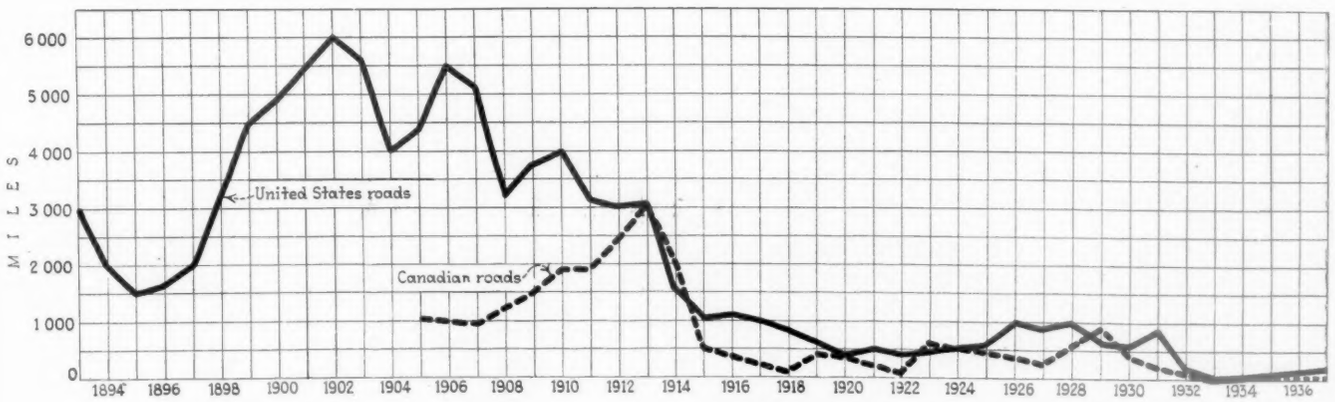
Promise of early revival of this activity at beginning of year not fulfilled because of falling revenues

Pleasant Creek Viaduct on the Berkeley Run Line of the Baltimore & Ohio

By George E. Boyd
Associate Editor

DESPITE the fact that a year ago the outlook for an upturn in railway construction was better than for any year since 1930, performance fell far short of expectations and the year ended less auspiciously than it began. Furthermore, there is no immediate prospect that railway construction will become more active in 1938, unless the railways can be assured of revenues that will enable them to secure the funds that are so necessary for construction purposes.

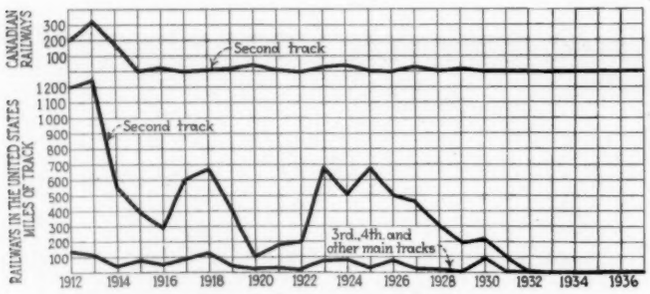
At the beginning of 1937, as the prospects for a permanent increase in railway earnings appeared to be brighter, there was much evidence that construction activity would increase correspondingly. At that time, many new facilities and revisions of existing facilities were greatly needed to permit the numerous improvements that had been made in operating methods to be developed to their full effectiveness. Budgets were prepared and plans were completed covering practically every type of facility. It was obvious, however, that, with a few exceptions, expenditures for the larger projects could not be made safely, and others that were needed badly were authorized cautiously or held in



New Lines Constructed in the United States in 1937 Increased to 148 Miles. No New Lines Completed in Canada

abeyance until it was certain that earnings would reach and remain at a higher level.

As these prospects failed to materialize, and the trend toward a lower level of revenues became unmistakable, the remaining projects were deferred until the time when earnings again reach the point where the financing of them becomes practicable. The result has been that


CANADIAN RAILWAYS
Second track
RAILWAYS IN THE UNITED STATES MILES OF TRACK
Second track
3rd, 4th and other main tracks
1912 1914 1916 1918 1920 1922 1924 1926 1928 1930 1932 1934 1936

Ten Miles of Multiple Track Completed in 1937

construction, while above the low level of 1936, showed only a relatively slight improvement over that year.

During 1936 an unprecedented amount of highway grade-separation work was completed or under way, mainly by reason of federal grants to states and municipalities for this purpose. Many of these projects were uncompleted at the end of the year and were carried over into 1937, during which year all but a few were completed. As federal appropriations for grade separations, approximately $200,000,000, neared the point of exhaustion at the end of 1936, only $27,000,000 remaining available for new projects, this type of construction fell off rapidly during 1937. Furthermore, those authorized since January 1, 1937, have generally been of such magnitude that they could be completed during the year. For these reasons, the carryover into 1938 is relatively small.

New Mileage Increases

It has been said frequently that the mileage of new lines under construction or completed during any year provides an excellent index of railway construction activities as a whole, and this is fully borne out by analysis of construction records over a long period. Confirming this trend, 148 miles of new lines were completed in 1937, compared with 93 miles in 1936. Also confirming the previous statement that construction activities relapsed after an apparently favorable start at the beginning of the year, reference to the tabulation of construction statistics shows that only a few new-line projects were under way or in prospect at the end of the year.

During the 20-year period ending with 1917, the mileage of new lines completed annually varied from a maximum of 6,026 in 1902 to a minimum of 933 in 1915, the former being the largest mileage recorded for a single year since these records were started. The average mileage completed year by year during these two decades was 3,679. During the 20-year period ending with 1937, the largest mileage was completed in 1928, when 1,025 miles were placed in operation, and the smallest was the 24 miles completed in 1933; the average for these two decades being 473 miles a year. These figures point impressively to the fact that the days of large external development have passed, and that future expenditures will be made more and more for internal improvements and for expansion of those facilities which affect the movement of traffic.

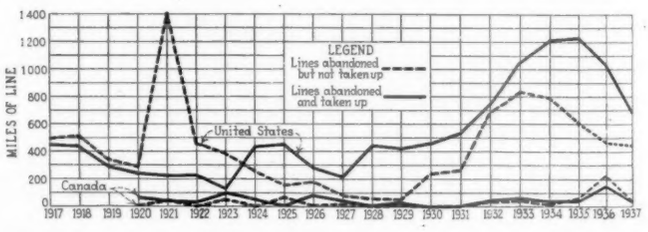
Of the total of 148 miles of new lines completed during the year, the largest single project was that of the Atchison, Topeka & Santa Fe, between Boise, Okla., and Las Animas, Colo., 111 miles, to complete a new route between Denver, Colo., and Houston, Tex. The next largest project was a 10-mile branch, built by the Seaboard Air Line in Florida; while the Virginian completed 9 miles of a 20-mile branch it is building in West

Miles of Main Track Built in 1937

U. S.	Number of companies building	First track	Second track	Third track	Fourth track	Total
Alaska	1	2.30	...	...	...	2.30
California	1	1.00	...	...	...	1.00
Colorado	1	90.56	...	...	...	90.56
Florida	1	10.00	...	...	...	10.00
Georgia	1	1.60	...	...	...	1.60
Illinois	1	...	...	1.07	...	1.07
Minnesota	1	1.32	...	...	...	1.32
Nebraska	1	...	2.15	...	...	2.15
New Jersey	2	5.08	...	...	...	5.08
New York	1	...	0.93	0.61	...	1.54
Nevada	1	...	3.44	...	...	3.44
Oklahoma	1	20.34	...	...	...	20.34
Pennsylvania	1	0.40	0.39	...	...	0.79
Texas	1	4.28	...	...	...	4.28
Utah	1	2.60	...	...	...	2.60
Virginia	1	...	1.81	...	...	1.81
West Virginia	1	9.00	...	...	...	9.00
Total		148.48	8.72	1.68	...	158.88

Miles of New Line Completed in the United States Since 1893

1893	3,024	1915	933
1894	1,760	1916	1,098
1895	1,420	1917	979
1896	1,692	1918	721
1897	2,109	1919	686
1898	3,265	1920	314
1899	4,569	1921	475
1900	4,894	1922	324
1901	5,368	1923	427
1902	6,026	1924	579
1903	5,652	1925	644
1904	3,832	1926	1,005
1905	4,388	1927	779
1906	5,623	1928	1,025
1907	5,212	1929	666
1908	3,214	1930	513
1909	3,748	1931	748
1910	4,122	1932	163
1911	3,066	1933	24
1912	2,997	1934	76
1913	3,071	1935	45
1914	1,532	1936	93
		1937	148


MILES OF LINE
LEGEND
Lines abandoned but not taken up
Lines abandoned and taken up
United States
Canada
1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937

Abandonments in Both the United States and Canada Decreased in 1937

Miles of New Lines Completed in Canada Since 1904

1904	316	1921	252
1905	1,181	1922	145
1906	1,007	1923	655
1907	976	1924	615
1908	1,249	1925	414
1909	1,488	1926	335
1910	1,844	1927	310
1911	1,898	1928	723
1912	2,232	1929	841
1913	3,013	1930	385
1914	1,978	1931	250
1915	718	1932	121
1916	290	1933	0
1917	207	1934	1
1918	135	1935	2
1919	433	1936	1
1920	305	1937	0

Virginia. The remainder of the first-track mileage completed during the year consisted mainly of short branches to reach industries or were undertaken in connection with line revisions.

No new mileage was completed in Canada. In fact, no extension of main-track mileage has occurred in that country since 1932, the mileage of new main track shown in the table since that year having all been in connection with line revisions and offset by corresponding abandonments, as revealed in the detailed description of construction activities and abandonments for the respective years.

Multiple-Track Mileage

Multiple-track mileage completed in 1937 varied only slightly from that of the previous year, the principal project having been an extension of double-track operation, 3.44 miles, on the Southern Pacific between Sparks, Nev., and Vista by converting an existing siding into main track. The next largest project was a 2.15-mile extension of second track at Hastings, Neb., by the Chicago, Burlington & Quincy. During the year 8.72 miles of second track and 1.68 miles of third track were placed in operation. This stands in strong contrast with the more than 1,200 miles of second track completed in 1913 and as much as 600 and 700 miles a year in several subsequent years. Likewise, during the period since 1912, the mileage of third and fourth tracks equalled or exceeded 100 miles in each of seven years, but has been negligible since 1932. Since 1925, there has been a general trend toward restriction of multiple-track mileage as a result of developments in the signaling field, which have greatly increased the traffic capacity of lines, thus making additional main tracks less necessary. With the extension of centralized traffic control it can be predicted that, for some time at least, multiple-track construction will remain at a low figure.

Miles of Lines Abandoned in the United States Since 1917

1917	942	1927	282
1918	959	1928	512
1919	637	1929	475
1920	536	1930	694
1921	1,626	1931	795
1922	677	1932	1,452
1923	513	1933	1,876
1924	693	1934	1,995
1925	606	1935	1,843
1926	457	1936	1,519
		1937	1,140

Miscellaneous Construction

Among the larger projects completed or still under way, the Pennsylvania completed its Newark, N. J., improvement which involved track elevation, the construction of new station facilities, the removal of Manhattan Transfer to Newark, and the construction of three bridges carrying six tracks across the Passaic river. This road has also undertaken the electrification of its main-line passenger and freight tracks between Perryville, Md., and Paoli, Pa., and Harrisburg. So rapidly has this work, which was started during the year, been prosecuted that on December 31 only 20 per cent of the project remained unfinished. The New York Central continued its schedule on its West Side improvement in New York. While this project is well toward completion, it is of such a nature that it must be carried out on an orderly schedule of consecutive items, for which reason it has been spread over a number of years.

The Santa Fe has prosecuted with vigor its extensive program of line revision and curve reduction between Chicago and points in California to promote faster service to the Pacific Coast. Similarly, the Burlington also carried out an extensive line revision program on its lines between Chicago and St. Paul, Minn., and between Chicago and Denver, Colo., on the route followed by its Zephyr trains between these cities. The few remaining projects were of more moderate magnitude, although they involved the construction, revision or extension of practically every type of facility in use on the railways.

In Mexico there has been a continuation on a moderate scale of the renewed construction activities which were first in evidence two years ago. These consisted mainly of improvements in shop facilities through extensions and the installation of more modern machinery, and the replacement of several light bridges. In 1935, a corporation was formed, known as Lineas Ferreas de Mexico, S.A. de C.V., to take over all projected lines, those which were not yet under actual construction and those which did not properly belong to the National system. On September 7, 1936, all lines then under construction were transferred to the government and on December 9, 1937, the corporation was dissolved after having turned its remaining property over to the new autonomous department of railways of the government.

Mileage Abandoned 1932 to 1937, Inclusive

	1932	1933	1934	1935	1936	1937	Total
Alaska	....	18.27	....	....	....	3.00	21.27
Alabama	20.82	28.08	36.22	....	42.09	9.95	137.16
Arizona	....	126.51	15.49	17.04	....	....	159.04
Arkansas	8.17	37.85	51.28	42.35	23.95	83.43	247.03
California	0.77	185.65	116.00	70.57	30.57	74.23	477.79
Colorado	26.39	56.57	6.31	84.98	86.30	231.46	492.01
Connecticut	....	....	....	33.93	....	25.31	59.24
Delaware	....	....	....	....	33.16	....	33.16
Florida	70.09	69.59	28.13	1.47	165.22	....	334.50
Georgia	66.41	46.56	126.63	12.34	....	....	251.94
Idaho	15.41	....	4.63	46.78	16.00	....	82.82
Illinois	54.83	38.30	160.82	13.90	32.06	87.42	387.33
Indiana	14.80	25.66	....	69.70	0.12	....	110.28
Iowa	53.12	79.51	52.44	83.32	208.75	14.44	491.58
Kansas	....	128.97	162.64	236.85	51.33	21.04	600.83
Kentucky	78.17	74.27	22.89	7.86	....	12.81	196.00
Louisiana	45.35	35.94	37.48	8.96	6.50	11.46	145.69
Maine	8.50	13.95	71.39	8.16	....	35.97	137.97
Maryland	1.00	....	....	25.60	....	3.75	30.35
Massachusetts	1.40	....	....	33.37	....	33.26	68.03
Michigan	201.99	51.05	71.39	166.20	40.16	64.65	595.44
Minnesota	91.07	12.94	53.37	50.93	31.94	23.18	263.43
Mississippi	24.10	33.50	85.57	....	....	....	143.17
Missouri	53.17	25.51	202.65	118.98	48.47	....	448.78
Montana	3.80	....	....	18.37	10.31	29.28	61.76
Nebraska	15.21	45.39	4.87	....	....	....	65.47
Nevada	....	....	26.27	0.31	....	....	26.58
New Hampshire	25.46	....	5.90	63.92	28.61	16.99	140.88
New Jersey	....	62.58	21.38	....	60.57	6.32	150.85
New Mexico	....	....	41.10	48.02	....	....	89.12
New York	58.32	4.14	30.82	30.58	57.00	29.33	210.19
North Carolina	22.24	53.10	18.50	10.00	11.39	25.17	140.40
North Dakota	....	....	....	....	16.36	....	16.36
Ohio	35.43	17.81	....	18.77	66.47	24.08	162.56
Oklahoma	....	9.24	79.01	....	8.60	15.95	112.80
Oregon	25.92	12.31	7.75	13.00	133.17	....	192.15
Pennsylvania	29.75	39.33	77.60	58.64	105.37	33.58	344.27
Rhode Island	....	....	....	....	....	16.33	16.33
South Carolina	44.05	....	1.54	76.50	25.00	15.80	162.89
South Dakota	....	....	24.04	26.65	16.43	....	67.12
Tennessee	74.01	39.81	41.23	64.15	54.84	47.94	321.98
Texas	107.10	188.82	126.13	77.81	39.12	44.63	583.61
Utah	19.71	3.05	16.19	....	....	6.88	45.83
Vermont	....	33.22	....	....	1.00	8.75	42.97
Virginia	112.89	51.69	4.80	21.74	....	4.45	195.57
Washington	16.36	55.86	12.01	88.35	12.69	10.44	195.71
West Virginia	1.36	77.49	26.08	12.13	21.10	8.85	147.01
Wisconsin	24.90	93.14	124.45	39.65	38.18	59.47	379.79
Wyoming	....	....	....	41.07	....	....	41.07
Total	1,452.07	1,875.66	1,995.00	1,842.95	1,522.84	1,139.60	9,828.12

Abandonments Again Exceed 1,000 Miles

There was a marked decrease in the mileage of lines abandoned during the year, although a total of 1,140 miles were abandoned, this being the sixth successive year and the seventh time that abandonments have exceeded 1,000 miles. This compares with 1,626 miles abandoned in 1921, 1,452 miles in 1932, 1,876 miles in

1933, 1,995 miles in 1934, the maximum of record, 1,843 miles in 1935, and 1,523 in 1936, the only years in which abandonments have exceeded 1,000 miles. The total abandonments for 1937 are 992 miles greater than

Lines Abandoned in the United States and Canada in 1937

United States	Lines abandoned and taken up miles	Lines abandoned but not yet taken up miles
Alabama Central		
Manchester, Ala., to Manchester Mines	2.00	
Arcadia & Betsy River		
Arcadia, Mich., to Henry	17.43	
Atchison, Topeka & Santa Fe		
Mulvane, Kan., to Viola	21.04	
Baltimore & Ohio		
Parkersburg, W. Va., to Placid	6.55	
Wellston, Ohio, to Superior Mine No. 10	1.64	
Wellston, Ohio, Rich Run Mine branch	0.94	
Boston & Albany		
Chatham, N. Y., to Ghent	2.42	
Boston & Maine		
Goffstown, N. H., to Henniker Junction	16.35	
Alton, N. H., to Bridge 265	0.64	
South Ashburnham, Mass., to Ashburnham		2.59
Cazenovia Southern		
La Valle, Wis., to Cazenovia	5.65	
Central of New Jersey		
Greenwich, N. J., to Bayside	3.03	
At Audenried, Pa.	0.13	
Chesapeake & Ohio		
Beaver, W. Va.	0.34	
Chicago & North Western		
Caledonia, Ill., to Rockford	14.22	
Shawno Junction, Wis., to Marston	7.44	
Northern Junction, Wis., to Southern Junction	13.47	
Arpin, Wis., to Eastmar	11.39	
Burdette, Minn., to Kasota	4.47	
Great Western, Mich., to Amasa		12.95
Boyer, Iowa, to Deloit	7.67	
Chicago, Burlington & Quincy		
At Des Moines, Iowa	2.24	
Rockport, Ill., to Pike		6.08
Chicago, Milwaukee, St. Paul & Pacific		
Kapowsin, Wash., to Electron	2.01	
Emerson Junction, Mont., to Dracut Junction	15.06	
Cannon Junction, Minn., to Cannon Falls		17.75
Lewistown, Mont., to Spring Creek Junction		1.05
Chicago, Rock Island & Pacific		
Kingfisher, Okla., to Cashion	15.95	
Oskaloosa, Iowa, to Beacon	1.83	
Clinchfield		
Hurricane, Va., to Shaft	1.20	
Colorado & Southern		
Wilds, Colo., to Arkins	0.43	
Watertown, Colo., to Climax		116.84
Como, Colo., to Alma		31.67
Dickey, Colo., to Keystone		6.84
Leadville, Colo., to Blind Tom Mine		2.44
Deer Park		
At Cachamkone, Wash.	3.00	
Delaware Valley		
East Stroudsburg, Pa., to Bushkill	12.40	
Denver & Rio Grande Western		
Walsenburg, Colo., to Trinidad	43.78	
Rouse Junction, Colo., to Mayne	3.97	
Texas Creek, Colo., to Westcliffe		25.49
Detroit, Caro & Sandusky		
Peck, Mich., to Roseburg		6.67
Duluth, Missabe & Iron Range		
Siphon Mine, Minn.	0.63	
Elgin, Joliet & Eastern		
Coal City, Ill., to South Wilmington		7.30
Erie		
Highland Mills, N. Y., to West Cornwall	6.88	
At Bradford, Pa.	0.51	
Hoytville, Pa.	0.14	
Ettrick		
Blair, Wis., to Ettrick	10.00	
Great Northern		
Hanover, Mont., to Lewistown		6.35
Flume, Mont., to Schoteau		6.82
Gulf, Colorado & Santa Fe		
Miles, Tex., to Paint Rock	16.74	
Hardwick & Woodbury		
Granite Junction, Vt., to Quarry Station	8.75	
Illinois Central		
Clay, Ky., to Dixon	9.94	
Buckingham, Ill., to Unz		5.81
Kansas & Sidell		
Hume, Ill., to Sidell	9.00	
Lehigh Valley		
Roan, Pa., to Oneida Junction	1.26	
End of Valentine branch, N. J.	0.47	
At Fairhaven, N. Y.	1.79	
Beaupland, Pa., to Bear Creek Junction	11.21	
Louisville & Nashville		
Saxton, Ky., to Jellico	2.09	
Reclassified as sidings, Saxton, Ky.		0.78
Lufkin, Hemphill & Gulf		
Bronson, Tex., to Hemphill		10.48
Maine Central		
Rumford, Me., to Oquossoc	35.97	
Michigan Central		
Morgan Park, Mich.	1.10	
Woodbury, Mich., to Delton	25.60	
Hastings, Mich.		0.90
Middleburgh & Schoharie		
Middleburgh, N. Y., to Schoharie	5.33	
Minneapolis & St. Louis		
Kalo Junction, Iowa, to Otho	2.70	
Minneapolis, St. Paul & Sault Ste. Marie		
Arpin, Wis., to Wisconsin Rapids	11.52	
At Brooten, Minn.	0.33	
Mobile & Ohio		
Mann, Ala., to Dawes	7.95	
Nashville, Chattanooga & St. Louis		
Lexington, Tenn., to Perryville	24.14	
Rock House Spur, Tenn., to Ravenscroft	12.50	
New York Central		
Peoria, Ohio, to Bellefontaine		16.50
New York, New Haven & Hartford		
Pine Plains Junction, N. Y., to Shekomeko	5.10	
At Van Deusenville, Mass.	0.45	
At Hopewell Junction, N. Y.	0.21	
Dighton, Mass., to Somerset Junction		3.24
Elmwood, Mass., to Stanley		1.15
East Warren, R. I., to Brayton, Mass.		6.34
East Thompson, Conn., to Webster, Mass.		2.51
Hyannis, Mass., to Hyannis Wharf		1.22
Middleboro, Mass., to Myricks		5.00
Melrose, Conn., to Ellington		2.30
Plymouth, Mass., to North Carver		7.42
Pascoag, R. I., to Douglas Junction, Mass.		6.82
Raynham, Mass., to Dean Street		2.41
Slaterville, R. I., to Harrisville, R. I.		6.34
Sterling Junction, Mass., to Sterling		2.09
Tariffville, Conn., to Collinsville, Conn.		10.11
Whitman, Mass., to East Bridgewater		3.31
Waterbury, Conn., to Southbury		11.60
Norfolk & Western		
At Norfolk, Va.	1.95	
At Pocahontas, Va.	0.32	
At Virginia City, Va.	0.98	
At Rift, W. Va.	1.27	
At Goodwill, W. Va.	0.62	
At Mora, W. Va.	0.07	
Norfolk Southern		
Moorehead City, N. C., to Beaufort		3.17
Mackeys, N. C., to Bishop Cross		22.00
Northern Pacific		
Crocker, Wash., to Wingate	5.43	
Northwestern Pacific		
Christine, Cal., to Albion	25.65	
Clearbrook Junction, Cal., to Clearbrook	1.00	
Pacific Coast Railway		
Santa Maria, Cal., to Betteravia and Guadaloupe		10.91
Pennsylvania		
Harrison, N. J., to Newark	2.04	
Verona, Pa., to Unity	1.29	
At Kroger, Pa.	1.49	
Warsaw Junction, Ohio, to Mohawk Dam	5.00	
Black Legs Creek branch, Saltsburg, Pa.		0.76
Pennsylvania-Reading Seashore Lines		
At various points in New Jersey	0.78	
Reading		
McAdoo, Pa., to Roan	4.39	
St. Louis-San Francisco		
Fayette Junction, Ark., to Pettigrew	40.15	
St. Louis Southwestern		
Rice Junction, Ark., to Hazen	17.24	
Stuttgart, Ark., to Eng'and	26.04	
San Francisco & Napa Valley		
Vallejo, Cal., to Napa		34.60
Southern		
Sumter Junction, S. C., to Sumter	15.80	
Vasper, Tenn., to Lafollette	11.30	
Southern Pacific		
Crump, Cal., to LeRoy	2.07	
Sterling Mountain		
Sterlington, N. Y., to Lakeville		7.60
Texas & Pacific		
Anson, Tex., to Hamlin	17.41	
Donaldsonville, La., to Ratcliff		11.46
Union Pacific		
Frisco, Utah, to Newhouse	6.88	
Wabash		
Stewardson, Ill., to Effingham	12.98	
Western Maryland		
Charlton, Md., to Nessle Junction	2.84	
Nessle, Md., to Snyder	0.91	
Westfield		
Kansas, Ill., to Casey	19.53	
White Pass & Yukon		
Shops, Alaska, to Boulder		3.00
Yale Short Line		
Casey, Ill., to Yale	12.50	
Total	688.93	450.67
Canada		
Canadian National		
At Farnham, Que.	0.32	
Brinlook, Ont., to Greenburn	6.08	
Mackies, Ont., to North Lake	24.00	
Port Perry, Ont., to Cresswell		13.00
Great Northern		
Hedley, B. C., to Princeton		23.49
Total	30.40	36.49

the mileage of new lines completed during the past year.

The largest single abandonment was that of the Colorado & Southern, 117 miles, between Watertown, Colo., and Climax. The next largest single abandonment was that of the Denver & Rio Grande Western between Walsenburg, Colo., and Trinidad, 44 miles, while the St. Louis-San Francisco came third with 40 miles between Fayette Junction, Ark., and Pettigrew. Among the entire railroads that were abandoned, the Arcadia & Betsy River stood first with 17 miles, the Delaware Valley was second with 12 miles and the Ettrick and the Lufkin, Hemphill & Gulf were practically tied with 10 miles and 10.5 miles, respectively. The abandonments reported in any year include all lines abandoned permanently during that year, whether or not the tracks have been taken up, and are not included in later years when the tracks of the latter lines are actually taken up.

Abandonments were not recorded prior to 1917, for the few lines that were discontinued from time to time were unimportant and usually in sparsely populated sections, generally logging roads and those serving mines, while they occurred so infrequently as to attract little attention. Beginning with 1917, however, in which year 942 miles of main lines were abandoned, abandonments have continued on a large scale ever since, the mileage abandoned in individual years having ranged from 282 in 1927 to 1,995 in 1934. During the 21-year period beginning with 1917, a total of 20,212 miles of lines have been abandoned, while during the same period only 10,434 miles of new lines have been constructed, leaving a net decrease of 9,778 miles of main lines.

Of equal interest with the mileage abandoned by individual roads and the total for all roads, is the distribution of these abandonments by states, for the states themselves are vitally concerned. During the six years ending with 1937, a total of 9,828 miles were abandoned in the 48 states and Alaska. For this six-year period Kansas heads the list with 601 miles abandoned; Michigan is second with 595 miles of lines abandoned; and Texas ranks third with abandonments aggregating 584 miles. By regions the abandonments during these six years have been: New England states, 465 miles; North Atlantic states, 768 miles; Southeastern states, 2,030 miles; Middle-western states, 3,056 miles; Northwestern states, 1,015 miles; Southwestern states, 1,813 miles, and the Pacific Coast states, 912 miles.

Prior to 1932, the abandonments in Canada and Mexico had been negligible. In 1932 and 1933, however, the Canadian roads abandoned a total of 282 miles. During 1934 there was a still further abandonment of 55 miles and in 1935 these figures were increased by 125 miles. In 1936 the abandonments in this country jumped to 399 miles, the largest of any year of record. During 1937 the abandonments aggregated 67 miles. No abandonments were recorded for the year by the Mexican roads, although operation was still suspended on several small roads serving mining interests.

Following is a detailed report by roads of construction projects completed or under way during 1937, the individual cost of which approximates or exceeds $100,000, except grade-crossing projects which are included regardless of cost:

Railway Construction in the United States

(Figures in parentheses indicate percentage of completion. In grade-crossing elimination, all work is done with federal or state funds unless otherwise indicated.)

Alaska

Important Work Undertaken: Replacement of wood bridge over Knik river with steel spans on creosoted pile piers, mile post 146.4, $235,000 (100). New hotel McKinley National Park, $350,000 (33).

Alton

Grade Crossing Elimination: Subways (cost of bridges only): State route 13, Higginsville, Mo., $36,869 (100). State route 23, Alma, Mo., $43,550 (100). State route 110, Shipman, Ill., $49,155 (100). State route 6, Rinaker, Ill., $47,762 (100). State route 6, South Joliet, Ill., $61,475 (100).

Alton & Southern

Third Track: East St. Louis, Ill., 1.07 miles.

Ann Arbor

Grade Crossing Elimination: Subways: U. S. route 16, Howell, Mich., $105,000 (25). State route 20, Mt. Pleasant, Mich., $95,000 (5).

Atchison, Topeka & Santa Fe

First Track: (Elkhart & Santa Fe.) Boise City, Okla., to Oklahoma-Colorado state line, 20.34 miles. Oklahoma-Colorado state line to Las Animas, Colo., 90.56 miles.

Grade Crossing Elimination: Overcrossings: Emporia, Kan. (100). North Santa Fe avenue, Chanute, Kan. (100). Guthrie, Okla. (100). Moses street, Cushing, Okla. (100). Purcell, Okla. (30). Kinsley, Kan. (100). Harper, Kan. (100).

Subways: South Chicago street, Joliet, Ill. (100). Cherryville, Kan. (100). Matfield Green, Kan. (100). Central avenue, Albuquerque, N. M. (100). Tijeras road, Albuquerque, N. M. (100). Gold avenue, Deming, N. M. (100). Wickenberg, Ariz. (100). Rivera, Cal. (100). Wilson Way, Stockton, Cal. (75).

Important Work Undertaken: Mechanical terminal, Chicago (20). Line change, between La Rose, Ill., and Wilbern (100). Line change, between New Boston, Iowa, and Argyle (100). Line change, between Wyaconda, Mo., and Gorin (100). Line change, between Gorin, Mo., and Rutledge (100). Line change, between Rutledge, Mo., and Fabius (100). Line change, between Fabius, Mo., and Kenwood (100). Line change, between Kenwood, Mo., and Hurdland (100). Line change, between Gibbs, Mo., and La Plata (100). Line change, between Sibley, Mo., and Atherton (100). Line change, between Ortiz, N. M., and Los Cerrillos (100). Line change, Nevin, Ariz. (100). Terminal building, San Francisco, Cal. (100).

(Gulf, Colorado & Santa Fe.) Viaduct, Oakland and Merlin streets, Dallas, Tex. (100). Subways: Conroe, Tex. (100). Corinth and Waco streets, Dallas, Tex. (100). South Washington street, Ardmore, Okla. (25).

Important Work Undertaken: Freight house and office building, Fort Worth, Tex. (100).

(Panhandle & Santa Fe.) Subway, Alpine, Tex. (100).

Atlanta & West Point

Grade Crossing Elimination: Overcrossings: Newman, Ga., $40,000 (100). La Grange, Ga., $25,000 (100).

(Western Railway of Alabama.) Subway, Opelika, Ala. (100).

Atlanta, Birmingham & Coast

Grade Crossing Elimination: Overcrossings: Ideal, Ga. (100). M. P. 202 (100). Musselwhite, Ga. (100).

Subways: Byronville, Ga. (25). Reeders Gap, Ga. (10).

Atlantic & Yadkin

Grade Crossing Elimination: Overcrossing, Gaston street, Greensboro, N. C. (100). Relocation of highway between Pilot Mountain, N. C., and King (100).

Atlantic Coast Line

Grade Crossing Elimination: Overcrossings: Elm City, N. C., $85,000 (100). Buie, N. C., $53,000 (100). Spout Springs, N. C., $21,000 (100). Yemassee, S. C., $67,000 (50). Red Hill, near Conway, S. C., $30,000 (100). Ogeechee road, near Felfair Junction, Savannah, Ga., $73,820 (25). Court street, Quitman, Ga., $156,460 (20). Thomasville, Ga., $167,640 (30). Kissimee, Fla., $126,000 (100). Auburndale, Fla., $49,566 (100). Burnetts lake, Alachua, Fla., $79,555 (100). Wall Springs, Fla., $62,500 (100). Drexel, Fla., $64,430 (100). Arcadia, Fla., $85,000 (100).

Subways: Smithfield, N. C., $101,000 (10). Maitland, Fla., $90,000 (100).

Reconstruction of subway bridge, Dunlop, Va., $60,549 (20). Reconstruction of overhead bridge, Orangeburg, S. C., $37,000 (100). Reconstruction of overhead bridge, Ogeechee road, near Union Junction, Savannah, Ga., $51,080 (25).

Baltimore & Ohio

Grade Crossing Eliminations: Franklin street, Washington, D. C., $200,000, under Public Act 138 (100). Washington, D. C., new bridge No. 38-A, $104,000, under Public Act 259 (100).

Overhead Bridges: Elm Park, Staten Island, N. Y., to Mariners Harbor, joint with city and state, $1,824,000 (100). Port Richmond, Staten Island, N. Y., to Tower Hill, joint with city and state, $1,724,000 (100). Tifft street, Buffalo, N. Y., joint with Erie, New York Central and Lehigh Valley, $955,000 (80). Beltsville, Md., $70,000 (20). Kensington, Md., $215,000 (80). Rockville, Md., $177,000 (100). Newburg, W. Va., $96,000 (100). Thornton, W. Va., $158,000 (100). Hundred, W. Va., $69,000 (100). Bristol, W. Va., $186,500 (100). Fetterman, W. Va., $295,000 (25). Edenburg, Pa., joint with Pennsylvania and Pittsburgh & Lake Erie, $462,000 (100). Zelienople, Pa., $240,000 (100). Lindsay, Pa., $218,200 (100). Stoyestown, Pa., $230,000 (25). Butler, Pa., $440,000 (100). Norwich, Ohio, $175,000 (100). Main street, Akron,

Ohio, joint with Erie and Pennsylvania, $1,490,000 (15). Piedmont, Ohio, $100,000 (55). Alsip, Ill., $90,000 (100). Kimmel, Ind., $105,000 (100). La Paz, Ind., $130,000 (100).

Subways: Dorsey, Md., $135,000 (50). Michigan avenue, Washington, D. C., $232,000 (100). Eastern avenue, Washington, D. C., joint with Pennsylvania, $207,000 (100). Clarksburg, W. Va., subway and overcrossing, $205,000 (25). West Washington, Pa., $250,000 (100). Ramey, Ohio, $80,000 (100). Kent, Ohio, $240,000 (100). Schenk, Ohio, $210,000 (100). East St. Louis, Ill., $170,000 (20).

Reconstruction of Grade Separation Structures: Fort Wadsworth, Staten Island, N. Y., $85,000 (100). Arrochar, Staten Island, N. Y., $145,000 (100). Machias, N. Y., $60,000 (100). Fort George G. Meade, Md., $36,500 (25). Mt. Jewett, Pa., $145,000 (85). Critchfield, Pa., $42,000 (35). Portsmouth, Ohio, $106,500 (100). Chillicothe, Ohio, $164,000 (100). Somerset, Ohio, $40,000 (60). Lima, Ohio, $75,000 (100). Mansfield, Ohio, $40,000 (100). Dorsey, Md., $135,000 (50).

Relocation of Highways: Smithburg, W. Va., $154,000 (65). Curwensville, Pa., $155,000 (60).

Important Work Undertaken: Installation of heating and alterations to Pier 22, New York, $150,000 (100). Reconstruction of Pier 12, Philadelphia, Pa., $394,000 (60). Race track facilities, Stanton, Del., $100,000 (100). Reconstruction of Bridges 58A, 58B and 58C, account of flood damage, Harmony, Del., $180,000 (100). Track changes in Howard, Park and Mt. Royal tunnels to effect increased clearance, Baltimore, Md., $177,500 (100). Howard street extension, Baltimore, Md., $293,000 (50). improvements to Piers 3, 4, 5 and 10, Baltimore, Md., $312,000 (100). Relocation of line, 15 miles, Berkley Rim, W. Va., to Grafton, in connection with construction of dam across Tygart river by the United States, $4,384,000 (100). Relocation of line between Beach City, Ohio, and Mineral City and 1½ miles on the C. T. & V. branch near East Sparta, Ohio, in connection with the flood control project, Muskingum Conservancy district, $1,400,000 (90). New freight house and office building, Chicago, $356,500 (100). Extension of passing sidings at various points, North Vernon, Ohio, to East St. Louis, Ill., $110,000 (100).

Belt Railway of Chicago

Grade Crossing Elimination: Viaduct, Kedzie avenue and 75th street, Chicago, $500,000 (100). Viaduct, 103rd street, Chicago, $98,200 (95).

Bessemer & Lake Erie

Grade Crossing Elimination: Viaduct, Butler Transfer, Pa., $366,000 (100).

Important Work Undertaken: Extension of 10 stalls of enginehouse, Greenville, Pa., $110,000 (100). Construction of 30-ft. concrete arch for creek and highway, and filling Plum Creek viaduct; also extension of yard tracks, North Bessemer, Pa., $782,000 (30).

Birmingham Southern

Grade Crossing Elimination: Overcrossing, Arkadelphia road, Bankhead highway, East Thomas, Ala., $39,627 (100).

Blue Ridge

Grade Crossing Elimination: Replacement of wooden overhead bridge with steel spans, Anderson, S. C., $36,000 (50).

Boston & Maine

Grade Crossing Elimination: Overcrossings: State street, Newbury, Mass., $312,000 (100). Barbers crossing, Worcester, Mass., $362,000 (100). Powwow crossing, East Kingston, N. H., $31,320 (100). West Bridge street, Manchester, N. H., $64,484 (100). Cow Meadow crossing, Newbury, Vt., $75,000 (100). West Main street, Ayer, Mass., $117,000 (100). Leominster road, Lunenburg, Mass., $77,400 (100). Astor House crossing, Ashburnham, Mass., $139,000 (100).

Buffalo Union-Carolina

Grade Crossing Elimination: Overcrossing, Union, S. C., $15,000 (100).

Canadian National (Lines in United States)

Grade Crossing Elimination: Overcrossings: South California avenue, Chicago (100). Seven Mile road and John R. street, Detroit, Mich. (to be completed in 1938).

(Vermont Central.) Subway, Berlin-West Milan highway, Groveton, N. H. (100).

Reconstruction of Existing Grade Crossing Separations: Grand River avenue, Detroit, Mich., joint with New York Central and Michigan Central (100).

Important Work Undertaken: Construction of warehouse at Detroit, Mich. (100).

Carolina & Northwestern

Grade Crossing Elimination: Overcrossings: Marden, N. C., $86,000 (100). Whitnell, N. C., $27,000 (100).

Central of Georgia

Grade Crossing Elimination: Overcrossings: Pooler, Ga., $63,750 (90). Columbus-Whitesville road, Muscogee, Ga., $31,500 (100). Rutland, Ga., $20,120 (100). Lorane, Ga., $20,080 (25). Andersonville, Ga., $33,590 (100). Ripley street, Montgomery, Ala., $58,000 (100). Madison street, Troy, Ala., $40,000 (100).

Subways: Rock Cut, Ga., $43,000 (100). Vincent, Ala., $101,000 (100).

Replacement of Existing Structures: Whitesburg, Ga., $17,380 (100). Mandeville, Ga., $22,670 (100). Buchanan, Ga., $22,640 (100). La Grange street, Greenville, Ga., $18,190 (70). Milledgeville, Ga., $51,040 (25).

Important Work Undertaken: Frame warehouse on concrete foundation, Savannah, Ga., $134,000 (85).

Central of New Jersey

First Track: Tremley, N. J., to Linden, 1.80 miles. At Linden, N. J., 0.62 miles.

Grade Crossing Elimination: Overcrossings: Asbury avenue, Roosevelt, N. J., $68,000 (100). Wilson avenue, Newark, N. J., $400,000 (100).

Subways: Central avenue, Westfield, N. J., $500,000 (100). Track elevation to eliminate 13 street crossings at grade and 2 railway crossings at grade, Elizabethport, N. J., $5,000,000 (30).

Important Work Undertaken: New rolling-lift bridge over Big Shark river, Avon-Belmar, N. J., $275,000 (100).

Charleston & Western Carolina

Grade Crossing Elimination: Overcrossing, state highway, Woodruff, S. C., $49,000 (100). Subway, state highway, Spartanburg, S. C., $38,000 (100).

Chesapeake & Ohio

Grade Crossing Elimination: Overcrossings: Clifton Forge, Va., $161,050 (100). Wicker avenue, Highland, Ind., $64,000 (100). Kennedy avenue, Highland, Ind., $119,000 (100). Newport News, Va., $95,456 (50). Viaduct over Tracks and James river, Buchanan, Va., $189,000 (50). Winifrede Junction, W. Va., $85,850 (10). Russell, Ky., $185,000 (5). Maysville, Ky., $144,900 (25). Enterprise, Ohio, $50,000 (10).

Subways: Undercrossing for street, with pedestrian overcrossing, Ivy, Va., $109,000 (100). First street, Huntington, W. Va., $180,000 (100). Pedestrian subway, Fifth street west, Huntington, W. Va., $20,000 (5). Kenova, W. Va., $149,600 (100). Pedestrian subway, Russell, Ky., $20,000 (started). Newport, Ky., $343,000 (100). Olentangy boulevard, Columbus, Ohio, $152,000 (100). Three undercrossings, at Fifth avenue, King avenue and diversion of Chambers road, Columbus, Ohio, $453,000 (100).

Reconstruction of Existing Grade Separation Structures: Culloden, W. Va., $50,000 (100). South Side bridge, Charleston, W. Va., $647,000 (100). Richmond, Ind., $73,000 (25).

Relocation of Highways: Trevilian, Va., to Gordonsville, $35,000 (not started). Danville, W. Va., to Madison, $110,000 (100).

New Line Under Survey: From Van, W. Va., to end of line, 6.60 miles.

Important Work Undertaken: Extension of passing siding, relocation of water column and construction of new water facilities, B. S. Cabin, Va., $133,643 (100). New coal dumper No. 3 and new yard, Presque Isle, Ohio, $1,550,500 (100). Two 100-car pull-in tracks, 13 forty-car classification tracks, one 30-car stub track and connecting track, Presque Isle, Ohio, $155,500 (100). Fire protection and additional equipment, Pier 9, Newport News, Va., $450,000 (90).

Raising track and placing riprap, various points to afford flood protection; revision of alinement and grade between Joshua Falls and Galts Mill; James river line, Richmond, Va., to Clifton Forge, $522,445 (84). Double track bridge on new alinement, over North river; extension of second track, 4,900 ft., Balcony Falls, Va., $242,000 (94). Additional yard and tracks, South Charleston, W. Va., $146,960 (100). Revision of line and reconstruction of roadbed, South Charleston, W. Va., to Buchanan, Ky., $129,850 (5). Widening and repair of masonry bridge, Garrison, Ky., $114,800 (10). Two additional tracks in eastbound yard, extension of yard and hump tracks and raise grade of hump tracks, Walbridge, Ohio, $291,344 (100).

Chesapeake & Western

Grade Crossing Elimination: Six grade crossings eliminated by relocation of highways, Rockingham county, Va., $100,000 (100).

Chicago & Eastern Illinois

Grade Crossing Elimination: Overcrossing, Dolton, Ill., $210,000 (100).

Chicago & Illinois Midland

Grade Crossing Elimination: Additional bridge to accommodate second lane of 2-lane highway converted to 4-lane highway, state route No. 4, Springfield, Ill., $45,000 (100).

Important Work Undertaken: Additional trackage to serve industries, Springfield, Ill., $100,000 (100).

Chicago & North Western

Grade Crossing Elimination: Overcrossings: Whitewood, S. D., $66,300 (100). Casper, Wyo., $78,800 (100). Cedar Rapids, Iowa, $118,832 (100). South Bell street, Fremont, Neb., 13 spans, $134,000 (100). Broad street, Fremont, Neb., 27 spans, $236,388 (100). Orin, Wyo., $89,000 (100).

Subways: Track elevation, 1¼ miles, to eliminate three grade crossings, Kenosha, Wis., $460,000 (10). Pedestrian subway, Kenilworth, Ill., $20,000 (100). Lincoln grade separation, Milwaukee, Wis., $250,000 (100). Silver Springs grade separation, Milwaukee, Wis., $250,000 (100). Lake Forest, Ill., $140,000 (100). Deerpath avenue, Lake Forest, Ill., $95,000 (100). Elmhurst, Ill., $128,000 (95). Lombard, Ill., $93,600 (100). Ishpeming, Mich., $29,000 (100). Negaunee, Mich., $150,000 (100). Grand avenue, Ames, Iowa, $320,000 (25). East boulevard, Rapid City, S. D., $46,815 (100). Brookings, S. D., $50,801 (100).

Reconstruction of Existing Grade Separation Structures: Chase avenue, Milwaukee, Wis., $500,000 (90). Railroad avenue, Evanston, Ill., $200,000 (100).

Relocation of Highways: Long Lake, Wis., to Tipler, 13-span timber trestle, $27,200 (100). Neshkoro, Wis., 6-span steel and concrete bridge, $100,000 (80).

Important Work Undertaken: Replacement of bridge 1810 with steel spans on concrete piers and abutments, $123,600 (35).

Chicago & Western Indiana

Grade Crossing Elimination: Viaduct, 103rd street, Chicago, $101,800 (95). Subway, Stony Island avenue and 95th street, Chicago, $226,000 (100).

Important Work Undertaken: Installation of three 502-hp. boilers, with forced draft and stokers, 49th street power house, $135,000 (30).

Chicago, Burlington & Quincy

Second Track: Hastings, Neb., 2.15 miles.

Grade Crossing Elimination: Overcrossings: Briar Bluff, Ill., $76,500 (100). Chariton, Iowa, $40,000 (100). Des Moines, Iowa, $600,000 (100). Nodaway, Iowa, $70,000 (100). Rome, Iowa, $35,000 (100). Bissel, Mo., $75,000 (100). Martinsburg, Mo., $58,000 (100). Weston, Mo., $50,000 (100). Norton, Kan., $51,000 (100). Fremont, Neb., $220,000 (100). Havelock, Neb., $75,000 (100). Lincoln, Neb., $56,000 (100). Lincoln, Neb., $50,000 (100). Nebraska City, Neb., $112,000 (100). Ravenna, Neb., $83,000 (100). Sanator, S. D., $55,000 (100). Cowley, Wyo., $80,000 (100). Manderson, Wyo., $100,000 (100).

Subways: Riverside, Ill., $178,000 (100). Sugar Grove, Ill., $116,000 (100). New London, Iowa, $45,000 (100). Bethany, Mo., $35,000 (100). Liberty, Mo., $30,000 (100). Alliance, Neb., $70,000 (100). Oreville, S. D., $47,000 (100). Denver, Colo., $300,000 (100). Denver, Colo., $230,000 (10).

Important Work Undertaken: Reconstruction of power plant, Lincoln,

Neb., $164,000 (100). Second track, 2.15 miles, rearrangement of yard, Hastings, Neb., $226,000 (100). Curve reduction, Aurora, Ill., to St. Paul, Minn., $220,000 (100). Curve reduction, Chicago to Omaha, Neb., $84,000 (100). Curve reduction, Omaha, Neb., to Denver, Colo., $275,000 (100). Extension of passing sidings and installation of centralized traffic control, Akron, Colo., to Denver, $758,000 (100).

Chicago Great Western

Grade Crossing Elimination: Overcrossings: Division street, Faribault, Minn., $330,000 (100). Southwest 21st street, Des Moines, Iowa, $35,000 (100). Fourteenth street, Des Moines, Iowa, joint with Chicago, Burlington & Quincy, Iowa Transfer, Chicago Rock Island & Pacific, Des Moines Union, Des Moines Western and Chicago Great Western, $371,800 (100).

Subways: State route 54, Villa Park, Ill., $56,000 (100). Wolf road, Hillside, Ill., $55,400 (100). Oakland avenue, Austin, Minn., $90,740 (100).

Chicago, Indianapolis & Louisville

Grade Crossing Elimination: Overcrossings: State route 40, Putnamville, Ind., $117,000 (100). State route 67, Gosport, Ind., $46,000 (100).

Chicago, Milwaukee, St. Paul & Pacific

Grade Crossing Elimination: Overcrossings: Okaton, S. D., $49,490 (100). Aberdeen, S. D., $25,000 (100). Medary, Wis., $1,967 (100). Davis Junction, Ill., $89,225 (100). Bridge Junction, Ind., $130,760 (100). Martelle, Iowa, $55,391 (100). Cedar Rapids, Iowa, $129,304 (100). White Butte, N. D., $33,540 (100). Gascoyne, N. D., $69,895 (100). Plummer, Idaho, $106,517 (100). Black River Junction, Wash., $143,838 (100). North Puyallup, Wash., $117,824 (100). Bellingham, Wash., $7,110 (100).

Subways: Wykoff, Minn., $49,200 (100). Faribault, Minn., $236,000 (100). Milan, Minn., $100,100 (100). Ortonville, Minn., $38,335 (100). Spring Grove, Minn., $23,000 (100). Java, S. D., $37,103 (100). Groton, S. D., $117,160 (100). Chase avenue, Milwaukee, Wis., $157,267 (100). Church street, Oconomowoc, Wis., $19,034 (100). Augusta boulevard, Chicago, $287,976 (100). Harper, Ill., $67,881 (100). Ewan, Wash., $44,741 (100). Ranier, Wash., $22,545 (100).

Chicago, Rock Island & Pacific

Grade Crossing Elimination: Overcrossings: East 14th street, Des Moines, Iowa, $120,000 (100). State route 14, Greene, Iowa, $35,000 (100). Walnut street, Avoca, Iowa, $75,000 (100). Primary road 90, DeSoto, Iowa, $40,000 (100). Manhattan, Kan., including bridge over Kansas river, $30,000 (100). Trunk highway 218, Faribault, Minn., $130,000 (100). U. S. route 59, Kenmoor, Mo., $75,000 (100). U. S. route 59, Rushville, Mo., $165,000 (100). State route 33, Jansen, Neb., $25,000 (100). U. S. route 81, El Reno, Okla., $192,000 (100). U. S. route 62, Choctaw, Okla., $100,000 (100). Eastern avenue, Oklahoma City, Okla., $110,000 (100). U. S. route 81, Enid, Okla., $110,000 (15). State route 2, Hicks, Tex., $127,000 (100). Hazlett road, North Ft. Worth, Tex., $82,000 (100). U. S. route 81, Wichita, Kan., $200,000 (15).

Subways: U. S. route 67, North Little Rock, Ark., $76,000 (100). Seventh street, Little Rock, Ark., $90,000 (100). U. S. route 6, Newton, Iowa, $75,000 (100). County road, Davenport, Iowa, $40,000 (100). Millerton, Iowa, $30,000 (100). State route 52, Crest, Mo., $20,000 (100). State route 33, Kingfisher, Okla., $283,000 (10). Buchanan street, Amarillo, Tex., $250,000 (100). Sixth street, Amarillo, Tex., $80,000 (100). U. S. route 34, Fairfield, Iowa, $125,000 (10).

Reconstruction of Existing Grade Separation Structures: Cascade avenue, Colorado Springs, Colo., $40,000 (100). Twenty-second street, Chicago, $400,000 (100). LaFayette street, Winnfield, La., $62,000 (100). Walnut street, Oklahoma City, Okla., $90,000 (20). Bijou street, Colorado Springs, Colo., $142,000 (100).

Important Work Undertaken: Produce warehouse, Cedar Rapids, Iowa, $100,000 (100).

Chicago, St. Paul, Minneapolis & Omaha

Grade Crossing Elimination: Overcrossings: Savage, Minn., $62,000 (100). Grand avenue, Sioux City, Iowa, $108,600 (100). Humboldt, S. D., $30,000 (100).

Subways: Cliff avenue, Sioux Falls, S. D., $60,000 (100).

Clinchfield

Grade Crossing Elimination: Overcrossing, Sullivan county, Tenn., $30,000 (100). Subways: Sullivan county, Tenn., $42,830 (100). Mead, N. C., $70,000 (100).

Colorado & Southern

Grade Crossing Elimination: Overcrossings: West 8th avenue, Denver, Colo., joint with Atchison, Topeka & Santa Fe and Denver & Rio Grande Western, $550,000 (100). U. S. route 26, Dwyer, Wyo., $30,000 (100).

Subways: West 38th avenue, Denver, Colo., joint with Denver & Salt Lake and Chicago, Burlington & Quincy, $245,000 (100). Forty-sixth avenue, Denver, Colo., joint with Chicago, Burlington & Quincy and Union Pacific, $300,000 (8).

(Ft. Worth & Denver City.) Subway: Buchanan street, Amarillo, Tex., joint with Chicago, Rock Island & Gulf, $315,900 (100).

Cumberland & Pennsylvania

Grade Crossing Elimination: Construction of connecting road and one grade crossing to eliminate three grade crossings, Morrisons, Md., $7,500 (5).

Danville & Western

Grade Crossing Elimination: Subway, including reconstruction of railway bridge over Smith river, Fieldvale, Va., $60,000 (90).

Delaware & Hudson

Grade Crossing Elimination: Subways: Hamilton street and West Maple street, Corinth, N. Y., $92,400 (75). South Grand, Grove, East and East Main streets, Cobleskill, N. Y., $725,900 (30). Coventry road, Depot Hill and station crossing, Nineveh-Harpursville, N. Y., $232,700 (90). Becker and Camerons crossings at Central Bridge, N. Y., $247,400 (10). Adams Basin crossing, Dunham's Basin, N. Y., $97,615 (100).

Reconstruction of Existing Grade Separation Structures: Bridge 2.88, Menands, N. Y., $218,400 (20). Bridge S29.76, Duanesburg, N. Y., $131,815 (100). Bridge 24.21, Duane, N. Y., $75,000 (100). Bridge 106.09, Bainbridge, N. Y., $99,300 (100). Bridge 3.66, Wilkes-Barre, Pa., $68,500 (100). New bridge to replace Butler Street viaduct, Wilkes-Barre, Pa., $369,900 (100).

Important Work Undertaken: Replacement of steel bridge No. 117.87 at Nineveh, N. Y., $45,280 (35). Reconstruction of bridge No. 89.33 at Otego, N. Y., $119,000 (50).

Delaware, Lackawanna & Western

Grade Crossing Elimination: Overcrossing, Linwood, N. Y. (100). Subways: South Geddes street, Syracuse, N. Y. (100). Oak, Murray, Walnut, Crandall, Charles, Jarvis streets, Glenwood avenue and Emma street, Binghamton, N. Y. (100). Depew, N. Y., joint with the Erie, Lehigh Valley and New York Central (75).

Reconstruction of Existing Grade Separation Structure, State route 454, Ithaca, N. Y. (100).

Important Work Undertaken: Extension to enginehouse, Scranton, Pa. (100). Installation of car retarder system at Hampton yard, Scranton, Pa. (100).

Denver & Rio Grande Western

Grade Crossing Elimination: Overcrossings: West 8th avenue, Denver, Colo., $375,000 (100). Buena Vista, Colo., $100,000 (75). Snowden, Colo., $85,000 (100). Bijou street, Colorado Springs, Colo., $125,000 (100). Cokedale, Colo., $40,000 (100). West Center street, Provo, Utah, $82,000 (100). Bocea, Utah, $20,000 (100).

Subways: Texas Creek, Colo., $40,000 (100). Cliff, Utah, $45,000 (100). Janet street, Helper, Utah, $125,000 (100). Midvale, Utah, $75,000 (100). Thirty-third South street, Salt Lake City, Utah, $134,000 (100).

Important Work Undertaken: Rearrangement of yard and additional tracks at Burnham, Colo., Funston, Clifton, Palisade and Grand Junction, $240,000 (100). Line and grade changes at various points, $550,000 (100). Reconstruction of power plant at Salt Lake City, Utah, $250,000 (100).

Denver & Salt Lake

Grade Crossing Elimination: Overcrossings: Troublesome, Colo., $75,000 (100). Rollinsville, Colo., $90,550 (100). Granby, Colo., $62,400 (100).

Subway: Denver, Colo., join with Chicago, Burlington & Quincy and Colorado & Southern, $300,000 (100).

Relocation of Highway: Elimination of two grade crossings at Wasatch, Colo., $400 (100).

Important Work Undertaken: Ballasting, bankwidening and grade rectification between Elkdale, Colo., and Granby; Sulphur Springs and Parshall, and Gore Cannon and Azure, $140,000 (100).

Des Moines Union

Grade Crossing Eliminations: Overcrossing: East 14th street, Des Moines, Iowa, $342,515 (100).

Detroit, Toledo & Ironton

Grade Crossing Elimination: Relocation of Highway, Thorps, Ohio, $81,500 (100).

Important Work Undertaken: Construction of new engine terminal and incidental facilities, Flat Rock, Mich., $328,353 (100).

Detroit & Toledo Shore Line

Grade Crossing Elimination: Overcrossing: M. P. 6.69, $1,100 (50).

Duluth, Missabe & Iron Range

First Track: Pacific Mine Spur, Minn., 1.32 miles.

Grade Crossing Eliminations: Relocation of Highways: State route 33, Grand Lake, Minn., $94,700 (100). U. S. route 53, Eveleth, Minn., $115,000 (100).

Important Work Undertaken: Relocation of yard tracks at Hull Rust yard, Hull Junction, Minn., $220,000 (75).

Duluth, South Shore & Atlantic

Grade Crossing Elimination: Subway: Silver street, Negaunee, Mich., joint with Chicago & North Western, $200,000 (100).

Elgin, Joliet & Eastern

Grade Crossing Elimination: Subway: State route 43, Upton, Ill., $210,000 (100).

Important Work Undertaken: Installation of stoker equipped boilers at Gary, Ind., $131,000 (100).

Erie

Second Track: Union, N. Y., 0.93 miles.

Third Track: Harriman. N. Y., 0.607 miles.

Grade Crossing Eliminations: Overcrossings: Elimination of two crossings at Belleville Turnpike, Kearny, N. J. (100). State route 9000, Monsey, N. Y. (100). Owego-Endicott road, Union, N. Y. (100). Tifft street, Buffalo, N. Y., joint with New York Central, Lehigh Valley, Erie, Pennsylvania, New York, Chicago & St. Louis, Baltimore & Ohio, and South Buffalo (82). Poland Center-Waterboro highway, Kennedy, N. Y. (10). Fairmount avenue, Jamestown, N. Y. (100). Elimination of crossings at South Main street, East Crosier street and Miller avenue, Akron, Ohio (45). State route 13, Bolivar, Ind. (30). Wicker avenue, Highland, Ind. (100).

Subways: McLean boulevard, Paterson, N. J. (85). Pike street, Port Jarvis, N. Y. (100). Elimination of crossings at Murray, Jarvis and Emma streets and Glenwood avenue, Binghamton, N. Y. (100). Transit road, Depew, N. Y., joint with New York Central, Lehigh Valley, Delaware, Lackawanna & Western, and Erie (70).

Reconstruction of Existing Grade Separation Structures: Mt. Jewett, Pa. (100). Saegertown, Pa. (100). State route 2, Hurlburt, Ind. (100).

Relocation of Highways: U. S. route 30, Griffith, Ind. (100). U. S. route 6, Highland, Ind. (100).

Important Work Undertaken: Alteration of office building and construction of freight house and track facilities at Michigan avenue and Exchange street, Buffalo, N. Y. (100).

Fort Smith & Western

Grade Crossing Elimination: Overcrossings: Coal Creek, Okla., $75,000 (100). Paden, Okla., $18,000 (100). Chandler, Okla., $48,000 (60).

Galveston, Houston & Henderson

Grade Crossing Elimination: Subway: State route 3, Houston, Tex. (100).

Galveston Wharf

Important Work Undertaken: Construction of banana pier, Galveston, Tex., $250,000 (40).

Georgia & Florida

First Track: Kingwood, Ga., to Moultrie, 1.6 miles.
Grade Crossing Elimination: Overcrossings: Sparks, Ga., and Adel, joint with Georgia Southern & Florida, $32,000 (100). DeBruce, Ga., $50,000 (90). Midville, Ga., $25,000 (85). Reconstruction of Existing Grade Separation Structure, Edgefield, S. C., $16,000 (100).

Georgia

Grade Crossing Elimination: Subway: Covington, Ga., $6,000 (100).

Great Northern

Grade Crossing Elimination: Overcrossings: Cambridge, Minn., $42,500 (100). Brook Park, Minn., $57,000 (100). Paynesville, Minn., $37,900 (100). St. Paul, Minn., $88,800 (100). Big Lake, Minn., $58,600 (100). Willmar, Minn., $105,000 (50). Clara City, Minn., $54,700 (85). McGregor, N. D., $3,900. Hannaford, N. D., $37,900 (100). Glenfield, N. D., $32,900 (100). Minot, N. D., $246,000 (100). Pillsbury, N. D., $33,700 (100). South Shore, S. D., $16,000 (100). Dover, Idaho, $88,000 (100). Everett, Wash., $70,000 (100). Bieber, Cal., $61,700 (100). Vancouver, B. C., $320,000 (to be completed 1938).
Subways: Stanley, N. D., $84,800 (100). Sioux Falls, S. D., $121,400 (100). Olney, Mont., $46,700 (100). Index, Wash., $48,200 (100). Wenatchee, Wash., $85,200 (100).
Important Work Undertaken: New power plant and direct steaming for 20-stall enginehouse, Hillyard, Mont., $199,850 (to be completed 1938). Ore dock and approach repairs, Allouez, Wis., $122,850 (100). Lining tunnel No. 6 with concrete, Troy, Mont., $130,460 (100).

Gulf Coast Lines

First Track: Brazoria, Tex., to Clemens, 4.28 miles.
Grade Crossing Elimination: Overcrossings: Lobdell, La., $100,000 (100). Fulton, La., $80,000 (100).
Subway, Edroy, Tex., $89,000 (100). (International-Great Northern) San Pedro avenue, San Antonio, Tex., $157,359 (100).

Gulf, Mobile & Northern

Grade Crossing Elimination: Overcrossing: Florenville, La., $64,174 (100). Subway, Mobile, Ala., $98,000 (25).

Houston Belt & Terminal

Grade Crossing Elimination: Subway, Polk avenue, Houston, Tex., $68,258 (100).

Illinois Central

Grade Crossing Elimination: Overcrossings: Arkadelphia road, Birmingham, Ala., $94,000 (100). Sioux City, Iowa, $17,000 (100). Fonda, Iowa, $50,000 (100). Ulmer, Iowa, $40,000 (100). Sheldon, Iowa, $25,000 (50). Mayfield, Ky., $75,000 (100). Clarks, Ky., $75,000 (100). Mayfield, Ky., $75,000 (90). Shreveport, La., $80,000 (100). Corinth, Miss., $40,000 (100). Batesville, Miss., $111,500 (100). Rolling Fork, Miss., $108,500 (100). Kosciusko, Miss., $42,500 (100). Starkville, Miss., $40,000 (100). Bentonia, Miss., $55,000 (100). Kelso, Miss., $107,600 (100). Utica, Miss., $25,000 (100). Winona, Miss., $35,000 (35). Dyersburg, Tenn., $40,000 (100). Jackson, Tenn., $50,000 (100). Memphis, Tenn., $200,000 (80).
Subways: Cloverdale, Ill., $20,000 (100). Condit street, Decatur, Ill., $100,000 (100). Belleville, Ill., $101,000 (100). Cicero avenue, Cicero, Ill., $235,000 (100). Eighth street, East St. Louis, Ill., $145,000 (100). Mississippi avenue, East St. Louis, Ill., $195,000 (100). Elmhurst, Ill., $106,000 (100). Riceville crossing, Fulton, Ky., $65,000 (80). Pomeroy, Iowa, $65,000 (100). Seventh street, Louisville, Ky., $100,000 (75). Ft. Knox, Ky., $50,000 (100). Bossier City, La., $200,000 (to be completed 1939). Clarksdale, Miss., $150,000 (100). Cliff avenue, Sioux Falls, S. D., $25,000 (100).
Important Work Undertaken: Raising track above flood plane, Reevesville, Ill., $215,000 (100).

Illinois Terminal

Grade Crossing Elimination: Overcrossing, Venice, Ill., $500,000 (90). Subway, Staunton, Ill., $25,000 (100).

Interstate

Grade Crossing Elimination: Relocation of highway and installation of one grade crossing to eliminate two others, Blackwood, Va., $47,700 (100).

Iowa Transfer

Grade Crossing Elimination: Overcrossing: East 14th street, Des Moines, Iowa, $342,515 (100).

Kansas City Southern

Grade Crossing Elimination: Overcrossings: Twenty-second street, Kansas City, Kan., $40,588 (100). Twenty-third street, Kansas City, Mo., joint with St. Louis-San Francisco, Missouri Pacific and Chicago, Rock Island & Pacific $536,000 (100). State route 57, Kniveton, Kan., $61,000 (100). U. S. routes 270 and 59, Howe, Okla., $50,000 (100). U. S. route 71, Kings, Ark., $135,000 (100).
Subways: U. S. route 64, Sallisaw, Okla., $65,000 (100). Fifth street, U. S. route 171, Leesville, La., $175,000 (30). State route 8, Woodworth boulevard, Port Arthur, Tex., $120,000 (100).
Important Work Undertaken: Reconstruction of draw-span portion of bridge across Sabine river, Ruliff, Tex., $118,000 (100).

Kentucky & Indiana Terminal

Grade Crossing Elimination: Subways: Dixie highway, Louisville, Ky., $165,000 (50). Twenty-first street, Louisville, Ky., $87,500 (50).

Lake Superior & Ishpeming

Grade Crossing Elimination: Overcrossings: Highway M-94, Harvey, Mich., $41,000 (60). Carlshend, Mich., $31,400 (60).

Lehigh & Hudson

Grade Crossing Elimination: Overcrossing, Maybrook, N. Y., joint with New York, New Haven & Hartford, $207,536 (50).

Lehigh & New England

Grade Crossing Elimination: Relocation of railroad and highway to eliminate two undercrossings, Tamaqua, Pa., $225,411 (100). Relocation of highway and D. L. & W. tracks; reconstruction of L. & N. E. bridge over relocated D. L. & W. tracks and relocated highway, construction of marginal route, Portland, Pa., $453,117 (to be completed 1938). Relocation of route 471 and replacement of bridge to provide greater clearance over undercrossing, Northampton county, Pa., $83,331 (100).

Lehigh Valley

Grade Crossing Elimination: Overcrossings: Washington avenue, New Market, N. J. (100). Athens-Towanda road, Athens, Pa. (10). Alpine-Cayuta highway, Alpine, N. Y. (100). Tifft street, Buffalo, N. Y. (90). West Henrietta-West Rush highway, West Henrietta, N. Y. (100). Ithaca-West Danby highway, Newfield, N. Y. (100). Town Line road, Homer, N. Y. (50). Honeoye Falls-Pittsford highway, Mendon, N. Y. (65). Ithaca County highway, Ithaca, N. Y. (75).
Subways: Willard-Geneva highway, Varick, N. Y. (100). Transit road, Depew, N. Y. (75). Niagara Falls boulevard, Tonawanda, N. Y. (100). Watkins-Lodi highway, Lodi, N. Y. (60).
Relocation of Highway, Westfield, N. J. (100).

Louisiana & Arkansas

Grade Crossing Elimination: Overcrossings: Stamps, Ark., $85,000 (100). McIntyre, La., $85,000 (100). Pineville, La., $65,000 (100). **Pineville, La., $95,000 (25).** Baton Rouge, La., $100,000 (100).

Louisiana, Arkansas & Texas

Grade Crossing Elimination: Overcrossing: Daingerfield, Tex., $40,000 (100). Subway, Farmersville, Tex., $30,000 (100).

Louisville & Nashville

Grade Crossing Elimination: Overcrossings: French Village, Ill., $95,500 (100). Nortonville, Ky., $80,000 (100). Russellville, Ky., $90,000 (100). Cynthiana, Ky., $125,000 (100). Louisville, Ky., $1,300,000 (100). Morton, Ky., $50,000 (100). McKee, Ky., $40,000 (100). Ruthann, Ky., $50,000 (100). Pennington, Va., $23,306 (100). Chatsworth, Ga., $55,000 (50). Fairmount, Ga., $44,000 (started). Junta, Ga., $20,000 (abandoned). Etowah, Tenn., $50,000 (100). Benton, Tenn., $40,000 (abandoned). Sutherland avenue, Knoxville, Tenn., $60,000 (100). State route 50, Columbia, Tenn., $75,000 (abandoned). Market street, Paris, Tenn., $70,000 (100). Jackson avenue and Scott street, Memphis, Tenn., $272,521 (90). State route 109, Gallatin, Tenn., $27,445 (100). Thompson's Lane, Vine Hill, Tenn., $100,842 (100). Welwyn, Tenn., $95,630 (started). Alabama City, Ala., $45,500 (100). Ninth avenue, Bessemer, Ala., $111,840 (100). Thomas, Ala., $75,820 (100). Evergreen, Ala., $143,500 (100). Day street, Montgomery, Ala., $20,800 (100). Black Creek, Ala., $35,000 (100). North Montgomery, Ala., $71,000 (100). Parkwood, Ala., $56,760 (100). Elmore, Ala., $35,000 (started). Letohatchie, Ala., $45,000 (started). Snow Hill, Ala., $16,000 (started). Milton, Fla., $102,000 (100). Henderson Point, Miss., $211,000 (abandoned). Lee, La., $272,000 (abandoned).
Subways: St. Clair avenue, East St. Louis, Ill., $229,500 (25). Lexington, Ky., $50,000 (50). Monmouth street, Newport, Ky., $344,540 (100). Madisonville, Ky., $50,000 (75). Spring street, Louisville, Ky., $171,760 (started). White, Ga., $20,000 (started). Main street, Brownsville, Tenn., $142,000 (100). Knoxville, Tenn., $42,957 (started). Attalla, Ala., $64,120 (90). Washington avenue, Mobile, Ala., $214,000 (100). Birmingham, Ala., $282,000 (started).
Relocation of Highway, Hog Jaw, Ky., $30,000 (100).
Important Work Undertaken: Erection of perishable shed, boiler house, stack and coal pit and tracks at Cincinnati, Ohio, $128,873 (50).

Maine Central

Grade Crossing Elimination: Overcrossings: Oakland, Me., $68,458 (75). Yarmouth, Me., $23,300 (90). Subway, Lewiston, Me., $220,000 (100). Relocation of Highways: Hartford, Me., $39,600 (100). Carroll, N. H. (100).

Midland Continental

Grade Crossing Elimination: Overcrossing, U. S. route 10, Spiritwood N. D. (100).

Minneapolis & St. Louis

Grade Crossing Elimination: Subways: State route 100, St. Louis Park, Minn., $120,000 (100). Summit street, Marshalltown, Iowa, $25,000 (100).

Minneapolis, St. Paul & Sault Ste. Marie

Grade Crossing Eliminations: Overcrossings: Almena, Wis., $100,000 (100). Minot, N. D., $175,000 (100). Subway, Mundelein, Ill., $150,000 (40). Reconstruction of Existing Grade Separation Structure, Wheelock Parkway, St. Paul, Minn., $30,000 (75).

Missouri-Kansas-Texas

Grade Crossing Elimination: Overcrossings: North Jefferson, Mo., $107,300 (100). Parsons, Kan., $74,376 (100). Cushing, Okla., $85,860 (100). Cleveland, Okla., $75,000 (100). Muenster, Tex., $96,661 (100). Cisco, Tex., $135,800 (30).
Subways: Sedalia, Mo., $124,148 (100). Chetopa, Kan., $80,723 (100). Caddo, Okla., $55,730 (100). Tulsa, Okla., $77,072 (50). Smithville,

Tex., $96,186 (100). Nogalitos street, San Antonio, Tex., $120,809 (100). Roosevelt avenue, San Antonio, Tex., $82,650 (100). Hillsboro, Tex., $106,000 (100). Ft. Worth, Tex., $37,693 (100). Burkland, Tex., $75,953 (100).

Minnesota & International

Grade Crossing Elimination: Overcrossing, Brainerd, Minn., $81,500 (100).

Missouri Pacific

Grade Crossing Elimination: Overcrossings: Kingshighway, St. Louis, Mo., $537,000 (100). Express highway, St. Louis, Mo., $338,000 (100). Twenty-third street, Kansas City, Mo., $591,000 (100). Fifty-first street, Kansas City, Mo., joint with St. Louis-San Francisco, $281,000 (100). Sixty-third street, Kansas City, Mo., joint with St. Louis-San Francisco, $396,000 (100). U. S. route 69, Stilwell, Kan., $128,500 (100). U. S. route 166, Coffeyville, Kan., $143,000 (100). U. S. route 54, Eureka, Kan. $81,300 (100). U. S. route 69, Godfrey, Kan., joint with St. Louis-San Francisco, $124,000 (100). U. S. route 36, Scandia, Kan., $275,000 (100). Utah street, Atchison, Kan., $112,000 (30). Eleventh street, Nebraska City, Neb., joint with Chicago, Burlington & Quincy, $165,000 (100). U. S. route 169, Nowata, Okla., $48,000 (100). U. S. route 165, Corey, La., $117,000 (100). U. S. route 165, Pollock, La., $125,000 (90). U. S. route 165, Galion, La., $114,600 (5). State route 39, Paragould, Ark., $80,000 (100). State route 11, Batesville, Ark., $76,500 (100). Jefferson street, Van Buren, Ark., $133,000 (100). Locust street, North Little Rock, Ark., $140,000 (100). Main street, Bryant, Ark., $50,600 (100). State route 22, Charleston, Ark., $49,600 (100).

(Union Railway of Memphis.) Jackson avenue, Memphis, Tenn., joint with Louisville & Nashville, $370,000 (75).

Subways: Ivory avenue, St. Louis, Mo., $240,000 (100). Broadway, Sedalia, Mo., joint with Missouri-Kansas-Texas, $167,000 (100). U. S. route 54, Sallyards, Kan., $43,000 (100). Forty-eighth street, Lincoln, Neb., $42,000 (100). State route 55, Fulton, Ark., $62,400 (100). West 7th street, Little Rock, Ark., joint with Chicago, Rock Island & Pacific, $190,000 (95).

(Union Railway of Memphis.) Florida street, Memphis, Tenn., $320,000 (100). McLean street, Memphis, Tenn., joint with Nashville, Chattanooga and St. Louis, $203,000 (100).

(Missouri-Illinois.) Broad street, Sparta, Ill., $68,000 (100).

Reconstruction of Existing Grade Separation Structures: U. S. route 61, Pevely, Mo., $16,000 (100). Inter-City viaduct, Kansas City, Mo., $946,000 (100). Tenth street, Lincoln, Neb., $61,500 (100).

Relocation of Highways: U. S. route 169, Garnett, Kan., joint with Atchison, Topeka & Santa Fe, $226,400 (100). State route 5, Norfolk, Ark., $112,200 (100).

Important Work Undertaken: Extension of 12 stalls to enginehouse, Kansas City,, Mo., $125,900 (100). Enginehouse, tracks, etc., Atchison, Kan., $117,000 (100). Installation of two 500-hp. boilers, North Little Rock, Ark., $106,600 (90).

Mobile & Ohio

Grade Crossing Elimination: Overcrossings: Jackson, Tenn., $100,000 (100). Corinth, Miss. (started). Shannon, Miss., $55,000 (100). Sucarnochee, Miss., $50,000 (100). Centerville, Ala., $40,000 (100).

Subways: Ava, Ill., $37,000 (100). Mayhew, Miss., $70,000 (100). Gordo, Ala. (not started).

Nashville, Chattanooga & St. Louis

Grade Crossing Elimination: Overcrossings: Lookout, Tenn., $90,000 (100). Somerville, Tenn., $50,000 (100). Hollow Rock, Tenn., $100,000 (100). Holts, Tenn., $25,000 (100). Kimbro, Tenn., $25,000 (100). Whorleys, Tenn., $75,000 (100). Chattanooga, Tenn., $16,000 (10). Old Jefferson, Tenn., $25,000 (100). Dalton, Ga., $20,000 (10).

Subways: Florida street, Memphis, Tenn., $35,000 (50). McLean street, Memphis, Tenn., $50,000 (75). Attalla, Ala., $60,000 (100). Hickman, Ky., $30,000 (10).

Relocation of Highways: Huntingdon, Tenn., $110,000 (100). Sherwood, Tenn., $25,000 (100).

New York Central

Grade Crossing Elimination: Overcrossings: West 34th street and 11th avenue to West 64th street, New York, $5,500,000 (100). West 76th to West 79th streets, New York, $1,904,000 (100). West 94th to West 98th streets, New York, $2,000,000 (100). West 41st street and 11th avenue, New York, $764,200 (10). West 34th to West 37th streets, New York, $1,031,500 (85). Palmer avenue, Bryn Mawr Park, Yonkers, N. Y., $183,000 (95). Carman, N. Y., $283,800 (100). Alden-Crittenden road, Crittenden, N. Y., $157,800 (100). North Main street, Jordan, N. Y., $245,600 (85). Tifft street, Lackawanna, N. Y., joint with six roads, $1,178,100 (90). Saugerties road, Lake Katrine, N. Y., $170,000 (100). South Ann and 6th streets, Little Falls, N. Y., $506,300 (80). Montrose, N. Y., $155,000 (100). North Main street, Newark, N. Y., $185,100 (100). Congress street, Schenectady, N. Y., $211,200 (100). Verona, N. Y., $192,200 (100). State route 5547, Whitesboro, N. Y., $173,200 (100). Belle Isle, N. Y., $258,000 (5). Syracuse, N. Y., track elevation, $18,000,000 (100). Trisket road, Cleveland, Ohio, $192,030 (100). East avenue, Erie, Pa., $212,351 (20). Indianapolis avenue, Hammond, Ind., $622,000 (100). Ridge road, Highlands, Ind., $126,000 (100). Mayflower road, South Bend, Ind., $69,100 (100). North Weedsport, N. Y., $158,800 (100).

Subways: Blossom road, Brighton, N. Y., $408,100 (90). Ontario street, Buffalo, N. Y., $395,900 (50). Transit road, Depew, N. Y., joint with Lehigh Valley, Delaware, Lackawanna & Western and Erie, $764,600 (90). Yonkers avenue, Dunwoodie, Yonkers, N. Y., $328,500 (35). Sheridan drive, Tonawanda, N. Y., $231,100 (60). U. S. route 20, Geneva, Ohio, $429,000 (95). East Mansfield street, Bucyrus, Ohio, $87,000 (90). East George street, Cedar Grove, W. Va., $40,256 (65). Madison street, Delta, Ohio, $152,432 (100). State route 52, Millbury, Ohio, $271,492 (70). State route 10, Cleveland, Ohio, $831,700 (15). State route 43, Otis, Ind., $80,000 (100). Lincoln highway, Schererville, Ind., $55,000 (100).

Reconstruction of Existing Grade Separation Structures: State route 554, Athens, Ohio, $59,426 (100). Cermak road, Chicago, $210,000 (100).

Relocation of Highways: State route 460, Cleveland, Ohio, $71,000 (85). U. S. route 60, Smithers, W. Va., $174,750 (100).

Important Work Undertaken: Changes to Riverside Park-City structure No. 4, West 72d to West 79th streets, New York, $450,000 (100). Covering over tracks West 79th street to St. Clair place, except West 94th to West 98th streets, structure No. 5, New York, $10,000,000 (90). Express highway between St. Clair place and Dyckman street, structures No. 6, 7 and 8, New York, $7,000,000 (95). Restoration and addition to warehouse, 11th avenue, New York, $300,000 (100). Warehouse and factory, West 30th street, under viaduct, New York, $300,000 (20). Filling in and retiring bridge No. 74, Newburgh, N. Y., $190,000 (50). New coaling facilities, East Syracuse, N. Y., $240,000 (100). Reconstruction of bridge No. 729-A, Batavia, N. Y., $190,000 (100). Reconstruction of bridge No. 156, Larrys Creek, Pa., $287,000 (75): New highway bridge, Little Falls, N. Y., $561,000 (100). Reconstruction of bridge No. 52-A, Mannsville, N. Y., $136,000 (10). Reconstruction of bridge No. 164-A, Pottsdam, N. Y., $100,000 (100). Reconstruction of bridge No. 345, Rensselaer, N. Y., $518,700 (100). Reconstruction of bridge No. A-20, Sennett, N. Y., $150,000 (100). Reconstruction of bridge No. 130, West Park, N. Y., $175,000 (100). Extension of 10 tracks and construction of five tracks, relocation of interlocking, construction of connection to Big Four and construction of 140-car siding, West Columbus, Ohio, $215,000 (100). Altering and protecting 31 bridges and culverts and placing riprap along roadway slopes and raising roadbed above new pool level in connection with United States dams in Great Kanawha river, Pt. Pleasant to Charleston, W. Va., $331,000 (45).

(Boston & Albany.) Overcrossings: Westboro, Mass., $98,000 (100). Shrewsbury street, North Grafton, Mass., $126,000 (100). Main street, Huntington, Mass., $342,500 (70). Medway street, Milford, Mass., $124,500 (70).

(Michigan Central.) Overcrossings: East Michigan avenue, Kalamazoo, Mich., $457,000 (100). U. S. route 25, Vienna, Mich., $230,600 (38). Subway, State route 31, South Bend, Ind., $169,000 (100). Reconstruction of Existing Grade Separation Structures: Livernois avenue, Detroit, Mich., $580,000 (100). Grand River avenue, Detroit, Mich., $305,000 (100). Telegraph road, Dearborn, Mich., $229,000 (100).

Important Work Undertaken: Completing office building, Detroit, Mich., $277,000 (100). Construction of switching and storage yard, Detroit, Mich., $158,700 (100).

(Indiana Harbor Belt.) Overcrossing, U. S. route 6, Broadview, Ill., $300,000 (5).

(Chicago River & Indiana.) Overcrossing, Pershing road, Chicago, $290,000 (100).

(Cleveland, Cincinnati, Chicago & St. Louis.) Subways: Madison street, Muncie, Ind., $220,000 (100). Edwardsville, Ill., $130,000 (100). Reconstruction of subway, State route 3, New Castle, Ind., $60,000 (100).

(Pittsburgh & Lake Erie.) Overcrossing: Twenty-first street, Monaca, Pa., $380,000 (80). Relocation of railway and highway, Bradys Run branch, Fallston, Pa., $37,500 (2). *Important Work Undertaken:* Construction of power house, Pittsburgh, Pa., $540,000 (20).

(Rutland.) Overcrossing, Wallingford, Vt., $100,000 (100). Reconstruction of highway to reduce traffic over existing crossings, East Dorset, Vt., $60,000 (100).

New York, Chicago & St. Louis

Grade Crossing Elimination: Overcrossings: Tifft street, Buffalo, N. Y., $33,000 (90). State route 3, Vermilion, Ohio, $298,000 (50). One hundred and third street, Chicago, joint with Chicago & Western Indiana and Belt Railway of Chicago, $670,000 (90).

Subways: Big Tree road, Bayview, N. Y., $43,581 (100). Main street, Bellevue, Ohio, $210,510 (40). Madison street, Muncie, Ind., $97,168 (100). Middle road, Crayton, Pa., $141,590 (100). Elm street, Lima, Ohio, $27,500 (100).

Important Work Undertaken: Reconstruction of steel viaduct, Silver Creek, N. Y., $250,000 (100).

New York, New Haven & Hartford

Grade Crossing Elimination: Overcrossings: Dedham road, Canton, Mass., $135,000 (100). Depot street, Sharon, Mass., $195,000 (100). West Mansfield, Mass., (includes pedestrian subway), $100,000 (70). School street, West Mansfield, Mass., $95,000 (100). Water street, Quincy, Mass., $350,000 (100). Andover, Conn., $100,000 (100). Canaan, Conn., $100,000 (60). Fairfield, Conn., $314,000 (100). North Haven, Conn., $200,000 (100). Willard avenue, Newington, Conn., $140,000 (50). Columbia road, Willimantic, Conn., $250,000 (30). Winnipauk, Conn., $60,000 (100). Davisville, R. I., $95,000 (100). Main street, Creamery and Campbell Hall roads, Maybrook, N. Y., joint with Lehigh & Hudson (100).

Subways: Cocasset street, Foxboro, Mass., $100,000 (85). Union street, Baintree, Mass., $170,000 (50). Windsor, Avon, Russell and Canton streets, Hartford, Conn., $350,000 (80). Merritt highway, Talmadge Hill, Conn., $38,000 (100).

Reconstruction of Existing Grade Separation Structures: South Main street, Port Chester, N. Y., $230,000 (100). Main street, Sharon Heights, Mass., (includes pedestrian subway) $90,000 (70). Washington street, Attleboro, Mass., $133,000 (100). Carolina, R. I., $22,000 (100). Gramatan avenue, Mt. Vernon, N. Y., $47,000 (100). Corbin avenue, New Britain, Conn., $22,000 (85).

Relocation of Highway, Simsbury, Conn., $100,000 (100).

Important Work Undertaken: Construction of building and track facilities for tenant, Roxbury, Mass., $352,000 (100).

New York, Ontario & Western

Grade Crossing Elimination: Subways: Cadosia, N. Y., $135,000 (100). Widening subway at Sidney, N. Y., $60,000 (100). Replacement of existing overcrossing, Sidney, N. Y., $204,000 (100).

Norfolk & Western

Second Track: Forest, Va., 1.81 miles.

Grade Crossing Elimination: Overcrossings: Bluefield, W. Va., $163,800 (100). Eckman, Va., $200,841 (80). Ironton, Ohio, $270,000 (80). South Norfolk, Va., $309,900 (60). Durham, N. C., $55,000 (100). Afton, Ohio, $87,900 (100).

Subways: Abingdon, Va., $46,181 (100). Suffolk, Va., $89,384 (100). Buena Vista, Va., $80,000 (20). Roanoke, Va., $234,192 (100). Kenova, W. Va., $187,000 (80).

Relocation of Highway, Pkin, Va., $22,000 (100).

Norfolk Southern

Grade Crossing Elimination: Revision of alinement to eliminate grade crossing, Plymouth, N. C., $40,000 (100). Overcrossings: Mumford street, Raleigh, N. C., $48,000 (100). Varina, N. C., $28,000 (100). McCullers, N. C., $12,000 (100). Duncan, N. C., $17,000 (100). Corinth, N. C., $18,000 (100). Hickory Grove, N. C., $18,000 (100). Stanfield, N. C., $18,000 (100). Charlotte, N. C., $40,000 (100). Biscoe, N. C., $100,000 (abandoned).

Subways: Greenville, N. C., $115,000 (100). Cabarrus street, Raleigh, N. C., $87,000 (100). Raleigh, N. C., $40,400 (50). Bonsal, N. C., $26,000 (30).

Northern Pacific

Grade Crossing Elimination: Subways: Jenswold street, Duluth, Minn., $70,000 (100). Crookston, Minn., $60,000 (100). Carlton, Minn., $6,000 (100). Tenth street, Fargo, N. D., $307,500 (45). Big Timber, Mont., $60,000 (100). Barry street, Glendive, Mont., $130,000 (80). Sand Point, Idaho, $35,000 (100). Pasco, Wash., $271,700 (100). Hunt, Wash., $47,300 (100). Centralia, Wash., $120,000 (100). Nisqually, Wash., $121,500 (100). Black River, Wash., $86,300 (100). Garfield, Wash., $30,000 (100). Union avenue, Tacoma, Wash., $123,000 (100). River street, Tacoma, Wash., $220,000 (100). First avenue, Seattle, Wash., $594,000 (100). Court street, Pendleton, Ore., $232,000 (100).

Important Work Undertaken: Warehouse for Pacific Fruit & Produce Co., Spokane, Wash., $175,000 (20). Warehouse, clearing site and tracks for Montgomery Ward Co., Spokane, Wash., $150,000 (25). Warehouse, clearing site and tracks for Sears-Roebuck Co., $160,000 (30).

Pennsylvania

First Track: Linden, N. J., 2.66 miles.

Grade Crossing Elimination: Overcrossings: Leesville avenue, Rahway, N. J. (100). Talmadge road, Metuchen, N. J. (100). Deans road, Deans, N. J. (35). Oak Tree road, Iselin, N. J. (100). Avenel street, Avenel, N. J. (100). Martha, Pa. (100). Odenton, Md. (5). Wilmington, Del. (35). Lindsey, Pa. (100). Tifft street, Buffalo, N. Y. (100). South Main street and Miller avenue, South Akron, Ohio (50). First street, Chester, W. Va. (100). Fourth avenue, Gary, Ind. (100). Clinton street, Ft. Wayne, Ind. (100). Hamlet, Ind. (100). Laraway street, Grand Rapids, Mich. (15). Montour Falls, N. Y. (50). Blasdell, N. Y. (100). Scottsville, N. Y. (100). Schererville, Ind. (100). Rome City, Ind. (100).

Subways: Ronk, Pa. (100). Edgewood, Md. (87). St. Clair avenue, East St. Louis, Ill. (30). Main street, Bellevue, Ohio (90). Goss road, Walbridge, Ohio (100). East Mansfield street, Bucyrus, Ohio (100).

Relocation of Highways: Colonia, N. J. (100). Carlisle, Pa., 12 crossings closed (100). Freedom, Pa., to Rochester, 2 crossings closed (100). Delphos, Ohio (100). Reconstruction of bridge, Penn, Pa. (100). Approximate cost of foregoing projects $947,400.

(Long Island) Overcrossing to eliminate two crossings, Glendale, L. I. (100). Subways: Main street, Smithtown, L. I. (100). Deer Park avenue, Deer Park, L. I. (100). Approximate cost of foregoing projects $791,200.

Important Work Undertaken: Track elevation, new station, three bridges over Passaic river and additional tracks, Newark, N. J. (100). Installation of four escalators, Pennsylvania station, New York (100). Tracks and yard facilities to serve General Motors Corp., Linden, N. J. (100). Remodeling of interior and exterior of passenger station and extension of footbridge across right of way, Trenton, N. J. (100). Rehabilitation of Dock Street freight station, Philadelphia, Pa. (100). Rearrangement of tracks and installation of car retarders in Enola yard, Enola, Pa. (80). Rearrangement of yard and engine facilities in connection with new terminals, Philadelphia, Pa. (89). Electrification of main tracks and portions of yards, including telegraph, telephone and signal installations, Morrisville, Pa., Paoli, and Perryville, Md., to Enola, Pa. and Harrisburg; Monmouth Junction, N. J. to South Amboy; Meadows Yard, N. J., Trenton, Millham Branch to Coalport; Richmond street and 52nd street, Philadelphia, Arsenal to Greenwich; Frankford Junction, to Pavonia (80). Additional ore handling facilities, Erie, Pa. (100). River-rail transfer facilities at Conway yard and Ohio river, Baden, Pa. (100). Reconstruction of viaduct over Silver Creek, Lake avenue and Jackson street, and subway at Central avenue, Silver Creek, N. Y., joint with New York, Chicago & St. Louis (100). New coal dock facilities and channel, Sandusky, Ohio (5). Relocation of highway and construction of undergrade bridge, Salunga, Pa. (100). Relocation of highway and construction of two undergrade bridges, Malvern, Pa. and Green Tree (100). Relocation of highway and reconstruction of undergrade bridge, Wawa, Pa. (100). Reconstruction of undergrade bridge, Blandenburg road, Washington, D. C. (10). Extension of bridge over canal, Canal, Del. (100). Construction of bridge, Kittanning, Pa. (100). Construction of bridge, East avenue, Erie, Pa. (50). Construction of bridge, Sonyea, N. Y. (100). Construction of bridge, Canawaugus, N. Y. (100). Construction of subway, Olentangy boulevard, Columbus, Ohio (100). Construction of bridge, Fosters, Ohio (100).

Approximate cost of foregoing projects $137,642,900.

(Long Island) Construction of bridge, 13th avenue, Brooklyn, N. Y. (100).

Pennsylvania-Reading Seashore Lines

Grade Crossing Elimination: Overcrossings: Weymouth-DaCosta road, Hammonton, N. J. (100). Buena-Tuckahoe road, Estelle Manor, N. J. (100). Twelfth street, Folsom, N. J. (85).

Important Work Undertaken: Reconstruction of bridge, Mantua boulevard, Sewell, N. J. (100).

Approximate cost of foregoing projects $481,100.

Reading

Grade Crossing Elimination: Overcrossing, Bethayres, Pa., elimination of two crossings, $462,041 (100). Subways: Mooresburg, Pa., $78,895 (100). Pennington, N. J., $105,828 (100).

Reconstruction of Existing Grade Separation Structures: Replacement of concrete and stone arch over Catawissa street, Frackville, Pa., $310,961 (100). Replacement of brick and stone arch over Cheltenham avenue, Oak Lane, Pa., $128,728 (100).

Richmond, Fredericksburg & Potomac

Important Work Undertaken: New store house, extension of machine shop, additional shop facilities, including machine tools, Acca terminal, Richmond, Va., $135,000 (100).

St. Louis & O'Fallon

Grade Crossing Elimination: Overcrossing, French Village, Ill. (100).

St. Louis-San Francisco

Grade Crossing Elimination: Overcrossings: Imboden, Ark., $160,000 (100). Jonesboro, Ark., $150,000 (100). West Pensacola, Fla., $95,000 (100). Hillsdale, Kan., $120,000 (25). Hickory Flat, Miss., $16,600 (100). Potts Camp, Miss., $31,600 (100). Twenty-third street, Kansas City, Mo., $590,900 (100). Fifty-first street, Kansas City, Mo., $280,000 (100). Sixty-third street, Kansas City, Mo., $395,400 (100). Beggs, Okla., $80,000 (100). Luther, Okla., $50,000 (100). Mounds, Okla., $55,000 (60). Okmulgee, Okla., $125,000 (100). Daggett street, Ft. Worth, Tex., $230,600 (100). Ballinger street, Ft. Worth, Tex., $82,200 (100).

Subways: Gravois, Mo., $300,000 (90). May avenue, Oklahoma City, Okla., $60,000 (90). Quapaw, Okla., $55,000 (100). Shea, Okla., $29,900 (100). Memphis, Tenn., $255,500 (80).

Reconstruction of Existing Grade Separation Structures: Harrisonville, Mo., $35,000 (100). Chandler, Okla., $11,000 (100). Preston, Okla., $40,000 (50).

Relocation of Highways: Bay, Ark., to Truman, $122,000 (30). Blue Springs, Miss., New Albany, Myrtle and Wallerville, $144,000 (50).

St. Louis Southwestern

Grade Crossing Elimination: Overcrossings: Campbell, Mo., $75,000 (100). Jonesboro, Ark., $75,000 (100). McNeil, Ark., $75,000 (100). Benton, La., $98,520 (60). Tyler, Tex., $280,000 (100).

Subways: Camden, Ark., $150,000 (100). Fordyce, Ark., $53,000 (100). Tyler, Tex., $57,000 (100).

Relocation of Highways: Buckner, Ark., $50,000 (100). Hickory Ridge, Ark., $50,000 (100). Stamps, Ark., $15,000 (100). Mt. Vernon, Tex., $95,000 (100). Mt. Pleasant, Tex., $85,000 (100).

Seaboard Air Line

First Track: Plains, Fla., to Sunvale, 10 miles.

Grade Crossing Elimination: Overcrossings: Carrsville, Va. (100). Lugoff, S. C. (100). Mars Hill, S. C. (100). Edgemoor, S. C. (50) Dixiana, S. C. (60). South Tampa, Fla. (100). West Palm Beach, Fla. (100). Brooksville, Fla. (100). Bartow, Fla. (100). Auburndale, Fla. (100). Maxville, Fla. (100). Smithsonia, Ga. (100). Rockmart, Ga. (100). Howells, Ga. (100). McRae, Ga. (100). Athens, Ga. (90). Coney, Ga. (35). Lawrenceville, Ga. (55). Cuthbert, Ga. (20). Montgomery, Ala. (100).

Subways: Cary, N. C. (100). Hamlet, N. C. (100). Henderson, N. C. (100). Vass, N. C. (2). Fulton, S. C. (100). Soperton, Ga. (100).

South Buffalo

Grade Crossing Elimination: Viaduct to eliminate crossings over 23 tracks of 7 railroads, Tifft street, Buffalo, N. Y. (not started).

Southern

Grade Crossing Elimination: Overcrossings: Appalachia, Va., $12,000 (100). Danville, Va., $50,000 (100). Enks, N. C., $20,000 (100). Sand Hill road, Buncombe county, N. C., $7,000 (100). Valdese, N. C., $6,000 (100). Charlotte, N. C., $22,200 (100). Hendersonville, N. C., $40,000 (80). Ridgeway, S. C., $65,000 (97). Taylors, S. C., $125,000 (100). Chesterfield street, Aiken, S. C., $21,000 (100). Gaffney, S. C., $44,000 (27). Fornace, S. C., $59,600 (100). Smyrna, S. C., $25,000 (100). Sparks, Ga., $25,000 (100). Roberts, Ga., $50,000 (100). Dalton, Ga., $20,000 (5). Piedmont avenue, Atlanta, Ga., $40,000 (100). Slidell, La., $135,000 (76). Seventeenth street, Knoxville, Tenn., $104,000 (8). Jonesboro, Tenn., $105,000 (98). Ninth street, Chattanooga, Tenn., $209,000 (60). Hixon, Tenn., $40,000 (80). Williamstown, Ky., $75,000 (started). Milltown, Ind., $125,000 (75).

Subways: Linden, Va., $46,000 (100). Orange, Va., $70,000 (100). Duffield, Va., $20,000 (100). Rhotan, Va., $43,000 (100). Danville, Va., $37,000 (100). Appalachia, Va., $55,000 (100). Williams crossing, Cary, N. C., $42,900 (100). Statesville, N. C., $85,000 (100). Marion, N. C., $18,000 (100). South Graham street, Charlotte, N. C., $85,000 (100). West 6th street, Charlotte, N. C., $138,000 (100). Gastonia, N. C., $97,000 (100). Lockhart, S. C., $40,000 (100). Hemphill avenue, Atlanta, Ga., $150,000 (100). Fifteenth avenue, Birmingham, Ala., $73,000 (100). Attalla, Ala., $160,000 (100). Bon Homme, Miss., $51,600 (74). Vasper, Tenn., $128,000 (95). Ludlow, Ky., pedestrian subway, $20,000 (100). Louisville, Ky., $80,000 (90).

Reconstruction of subway, Speers Ferry, Va., $55,000 (100).

Southern Pacific

Second Track: Sparks, Nev., to Vista, 3.438 miles.

New Line Under Survey: Redding, Cal., to Delta, 30 miles.

Grade Crossing Elimination: Overcrossings: Jibboom street, Sacramento, Cal., $175,000 (100). Hot Springs, Utah, $92,774 (100). Union avenue, Portland, Ore., $411,449 (100). Cook, Ore., $73,000 (100). Marshfield, Ore., $65,000 (56). Oakridge, Ore., $25,038 (100). Dolan road, Castroville, Cal., $22,611 (100). Figueroa street, Los Angeles, Cal., including bridge over Los Angeles river, $690,174 (100). McClintock avenue, Normal Junction, Ariz., $50,000 (100). Ruins road, Coolidge, Ariz., $39,000 (100).

Subways: Oakland, Cal., $168,631 (100). Salem, Ore., $328,544 (100). Oregon City, Ore., $338,000 (100). Aurora, Ore., $173,628 (100). Mill avenue, Tempe, Ariz., $75,000 (100). Gold avenue, Deming, N. M., joint with Atchison, Topeka & Santa Fe., $100,000 (100).

Reconstruction of subway, Whiteson, Ore., $15,000 (43).

Relocation of Highways: Six subways under tracks of two roads, Niles, Cal., $468,432 (100). Greenville, Cal., $73,500 (started). Redmond, Cal., $40,000 (started). Cuesta, Cal., $110,000 (10).

Important Work Undertaken: Construction of retaining wall and reconstruction of snow shed, Eder, Cal., $150,000 (100). Revision of alinement on shoofly around tunnel No. 8 destroyed by fire, Lamoine, Cal., $108,000 (100). Strengthening seven bridges across Santa Clara river, Russ-Lang, Cal., $166,000 (60). Relining of 23 tunnels between Crescent Lake, Ore., and Crescent, $178,000 (100). Installation of water treating plant, replacement of and additions to surgical equipment and furnishings, and repairs to General hospital, San Francisco, Cal., $146,000 (60).

(Lines in Texas and Louisiana) Grade Crossing Elimination: Overcrossings: South Main street, Ft. Worth, Tex., $256,566 (100). Rayne, La., $145,000 (100). Iowa Junction, La., $115,000 (100). Lake Charles, La., $111,000 (100). Jennings, La., $120,000 (50).

Subways: Goliad, Tex., $69,475 (100). San Antonio, Tex., $168,677 (100). Nogalitas street, San Antonio, Tex., $266,519 (100). Frio road, San Antonio, Tex., $117,589 (100). Yoakum, Tex., $184,271 (100). Yale street, Houston, Tex., $157,619 (100). Rio Grande avenue, Ft. Worth, Tex., $160,964 (100). Paige, Tex., $100,328 (100).

Spokane International

Grade Crossing Elimination: Overcrossing, Dover, Idaho (100).

Spokane, Portland & Seattle

Grade Crossing Elimination: Overcrossing, South Cheney, Wash., $45,000 (100).

Important Work Undertaken: Remodeling of enginehouse and replace-

ment of turntable, Vancouver, Wash., $97,500 (90). Replacement of seven culverts, North Bonneville, Wash., to Wishram, $77,000 (30). Addition of riprap, North Bonneville, Wash., to Lyle, $180,000 (30).

Tennessee Central

Grade Crossing Elimination: Reconstruction of Existing Grade Separation, Masonville, Ky., $17,000 (100).
Relocation of Highways: U. S. route 70, Cookeville, Tenn., $103,179 (100). State route 12, Nashville, Tenn., to Ashland City, $50,950 (100).

Terminal Railroad Association

Grade Crossing Elimination: Overcrossing: Broadway, Venice, Ill., $425,000 (100). Subway, Broadway, East St. Louis, Ill., $400,000 (25).

Texas & Pacific

Grade Crossing Elimination: Overcrossings: Grand Cane, La., $125,000 (100). Shreveport, La., $158,000 (100). Greenwood, La., $100,000 (100). Daggett street, Ft. Worth, Tex., $214,000 (100). Ballinger street, Ft. Worth, Tex., $90,000 (100).
Subways: LaFource street, Donaldsonville, La., $65,000 (5). Marshall, Tex., $71,200 (100). Conner avenue, Ft. Worth, Tex., $40,000 (100). Preble, Tex., $116,500 (100). Brazos, Tex., $60,000 (100).

Tooele Valley

First Track: Main Line, Utah, to West International, 2.6 miles.

Toledo Terminal

Grade Crossing Elimination: Overcrossing: Woodville road, Toledo, Ohio, $240,000 (100).

Union Pacific

Lines Under Survey: Nevens, Neb., to Lewellen, 33.16 miles.
Grade Crossing Elimination: Overcrossings: Broad street, Fremont, Neb., $220,000 (100). Jeffers street, North Platte, Neb., $115,000 (100). Colorado street, Manhattan, Kan., $500,000 (100). Garfield, Utah, $100,000 (100). Provo, Utah, $164,000 (100). Pendleton, Ore., $232,000 (100). Argo yards, Seattle, Wash., $582,000 (100). Black River Junction, Wash., $200,000 (100). Hughes Spur, Wash., $100,000 (100). Lincoln, Neb., $56,000 (100). Belvidere, Neb., $45,000 (30). Pocatello, Idaho, $170,000 (90). Thornton, Idaho, $100,000 (20). Warm River, Idaho, $100,000 (95). Union avenue, Portland, Ore., $72,000 (20). Tumwater, Wash., $257,000 (40). River street, Tacoma, Wash., $277,000 (100).
Subways: Second street, Lawrence, Kan., $312,000 (100). Green River, Wyo., $254,000 (100). Ninth street, Evanston, Wyo., $229,000 (100). Brigham, Utah, $94,000 (100). Pleasant Grove, Utah, $80,000 (100). Mountain Home, Idaho, $125,000 (100). Clark avenue, Las Vegas, Nev., $150,000 (100). Ozone, Wyo., $135,000 (20). St. Vrains, Colo., $53,000 (100). Ontario, Ore., $200,000 (20). Colfax, Wash., $55,000 (25).
Important Work Undertaken: Construction of passenger and shopmen's subways, Cheyenne, Wyo., $377,000 (100). Construction of additional yard trackage and installation of track scales, Denver, Colo., $143,000 (100). Constructing and equipping Challenger Inn., Sun Valley Village, Ketchum, Idaho, $1,000,000 (100). Replacing 33-pile spans of pile trestle with 5 steel spans, Peoria, Colo., $98,000 (100). Replacing 49-span pile bridge with truss spans, Byers, Colo., $116,300 (100). Replacing pile bridge with through lattice truss spans, $93,000 (100).

Union Railroad

First Track: Wilson, Pa., 0.4 miles.
Second Track: Wilson, Pa., 0.4 miles.
Important Work Undertaken: Enlargement and improvement of shop and enginehouse facilities, Hall, Pa., $110,000 (100).

Union Railway

Grade Crossing Elimination: Overcrossing, Jackson avenue, Memphis, Tenn. (75).
Subways: Florida street, Memphis, Tenn. (75). McLean street, Memphis, Tenn. (100).

Virginian

First Track: Simon, W. Va., to Mile Post No. 9, 9 miles.
New Road Under Construction: Mile Post No. 9 to Kopperston, W. Va., 10.4 miles.
Grade Crossing Elimination: Overcrossings: Mullens, W. Va., $78,600 (100). Harper, W. Va., $112,600 (100). South Norfolk, Va., $134,130 (100).

Wabash

Grade Crossing Elimination: Overcrossings: Gary, Ind., $200,000 (100). Edwardsville, Ill., $29,000 (100). St. Louis, Mo., $750,000 (100).
Subways: Toledo, Ohio, $377,300 (75). Peru, Ind., $155,000 (100). Ft. Wayne, Ind., $357,000 (100). Staunton, Ill., $140,000 (100). Decatur, Ill., $204,000 (100). Moulton, Iowa, $25,000 (100).
Reconstruction of Existing Grade Separation Structures: Danville, Ill., $130,000 (100). Ferguson, Mo., $100,000 (100).

Western Maryland

Grade Crossing Elimination: Overcrossing: Elkins, W. Va., $199,000 (60). Subways: Waynecastle, Pa., $215,000 (100). Elkins, W. Va., $59,000 (100). Relocation of Main Track, New Franklin, Pa., $120,000 (100).

Western Pacific

Grade Crossing Elimination: Overcrossings: Winnemucca, Nev., $75,000 (100). Garfield, Utah, $52,413 (100). Wells, Nev., $60,000 (100). Livermore, Cal., $104,000 (10).
Subways: Niles, Cal., six subways and reconstruction of one subway bridge, W. P. allotment $169,000 (100). Oakland, Cal., $87,000 (100). Stockton, Cal., $45,000 (100). Stone Cut, Cal., $99,000 (5).
Important Work Undertaken: Reconstruction of bridges at various points, $150,000 (100). Extension of enginehouse and installation of drop pit table, Oroville, Cal., $99,000 (100). New 120-ft. turntable to replace 80-ft. structure, addition of two stalls to enginehouse and installation of drop pit table, Elko, Nev., $107,000 (100). New 120-ft. turntable to replace 80-ft. structure and enlargement of enginehouse, Wendover, Utah, $63,000 (100).

Wheeling & Lake Erie

New Lines Under Construction: Bolivar, Ohio, to Sherrodsville, 14.61 miles. At Beach City, Ohio, 1.19 miles. Beach City, Ohio, to Barrs Mills, 8.14 miles. (All in connection with Muskingum Conservancy district reservoir work.)
Grade Crossing Elimination: Overcrossing, Canton, Ohio, $160,000 (100).
Important Work Undertaken: Cellular type bulkhead, 1,313 ft. long, Slip No. 1, Huron, Ohio, $252,263 (100). New yard facilities in connection with new car dumper, Huron, Ohio, $139,214 (100). High lift car dumper, including substation, dock building, kickbacks and approaches, Huron, Ohio, $808,124 (100). Reconstruction of Bridge No. 120-74, Conesville, Ohio, $102,159 (100). Deepening Slip No. 2 and Winding Basin, Huron, Ohio, $122,840 (100).

White Pass & Yukon

First Track: Revision of line, Shops, Alaska, to Boulder, 2.3 miles (100).

Yreka Western

First Track: Yreka, Cal., to South Yreka, 1 mile.

Railway Construction in Canada

Canadian National

New Line Under Construction: Senneterre, Que., to Rouyn, 100.61 miles; 42 miles of track laid (to be completed in 1938).
Grade Crossing Elimination: Overcrossings: Brosseau, Que. (100). Alderdale, Ont. (100).
Subways: Victoria avenue, Danforth, Ont. (to be completed 1938). Eighteenth street, New Toronto, Ont. (to be completed 1938). Highway 31, Morrisburg, Ont. (100). Highway 19, Grand Mere, Que. (100). St. Davids, Ont. (100). Highway 27, Weston, Ont. (100). Provincial highway, Field, Ont. (100). Elphinstone, Man. (100). Sioux Lookout, Ont. (100).
Relocation of Highways: Chester, N. S. (100). Cote, Sask. (100).
Important Work Undertaken: Reconstruction of St. John River bridge and construction of engine facilities, subways, etc., at Fredericton, N. B. (to be completed 1938). Replacing of timber roadway with concrete filled steel rail grid slabs at Montreal, Que. (to be completed 1938). Construction of ramps and rearrangement of tracks to permit opening of Terminal avenue, Vancouver, B. C. (to be completed 1938). Riprap to provide protection of embankments from floods, Bulkley and Skeena subdivisions, B. C. (100).

Canadian Pacific

Grade Crossing Elimination: Overcrossings: Mortlach, Sask. (100). Swift Current, Sask. (100). Subway, Kingsgate, B. C. (100).
Relocation of Highways: Assiniboine, Sask. (100). Biggar, Sask. (100).
Important Work Undertaken: Revision of alinement, Mountain subdivision, $250,000 (50). Extending embankments for second track, raising sags and applying ballast, 50 miles between Ft. William, Ont., and Winnipeg, Man., $900,000 (100).

Dominion Atlantic

Grade Crossing Elimination: Relocation of Highway, Clementsport, N. S., $33,000 (100).

Quebec Central

Grade Crossing Elimination: Overcrossing: Lennoxville, Que., $96,000 (90).

Railway Construction in Mexico

National of Mexico

Grade Crossing Elimination: Overcrossings: Aguascalientes-Tampico line, km. L.-532, San Luis Potosi, $42,000 (100). Maravatio-Zitácuaro, K.M. 6-84, Michoacán, $5,300 (100).
Important Work Undertaken: New station and station grounds, Neuvo Laredo, San Luis Potosi, $207,000 (10). New station and rearrangement of tracks, Tampico terminal, Tampico, $167,000 (100). New steel bridge and concrete sub-structure, km. L.-666, Tampico, $166,000 (70). Relocation of bridge to provide better crossing of the Padro river, nine-steel spans, 1,440 ft., km. A.-1521, Mexico City to Cuidad Juárez, $180,000 (60). Reconstruction and extension of shop and installation of modern machine tool equipment, Aguascalientes, $425,000 (90). Extension of shop and installation of shop machinery, Nonoalco shop, Mexico City, $277,000 (100). Installation of modern machinery in locomotive shops, Monterey, N. L., $100,000 (100).

Locomotives Ordered in 1937

Domestic volume of 368 falls below 1936 figure but is twice any year from 1931 to 1935; exports up to 56 locomotives

By William H. Schmidt
Associate Editor

AFTER a year of violent fluctuations in volume, which, in its early months, promised to pile up a buying record, the total number of locomotives ordered for domestic service during 1937 has finally been determined as 368, which, while it is more than twice the volume of orders placed in any of the years 1931 to 1935, inclusive, nevertheless represents a substantial deceleration in buying from the 533 locomotives ordered during 1936.

Responsibility for the disappointing year-total for 1937 may be attributed to the slump in all equipment buying which became particularly evident during June and continued during the whole of the second half of the year.

Table I—Locomotive Orders in 1937

For service in the United States	368
For export to other countries	56
For service in Canada and exports from Canada	57
Grand total	481

By the end of the first half of the year, 228 locomotives had already been ordered, a total substantially higher than each of the entire 12-months' totals of the years 1931 to 1935, inclusive. Indeed, the volume of locomotive buying during the first quarter of the year exceeded that of the corresponding quarter of 1936 by about 50 per cent. But by the end of 1937, as has been pointed out, the comparative 12-months' figures for 1937 and 1936 stood at 368 and 533, respectively.

The 1937 total comprises 176 steam locomotives, 36 electric locomotives and 156 power units of other types, including Diesel-electric, gasoline-mechanical, etc. The 1936 total was made up of 434 steam locomotives, 24 electric and 75 of other types of motive power. In line with a policy established in 1936 and explained in the *Railway Age* of January 2, 1937, page 70, there are included in the Diesel-electric category those locomotives for streamlined trains which are power units exclusively and are classed as non-revenue units. Power *cars* are tabulated as rail-motor cars, elsewhere in these columns.

The largest single locomotive order for the year—calling for 25 steam locomotives—was placed by the Union Pacific. This also represents the highest total ordered by any road in all categories of motive power.

Table II—Orders for Locomotives Since 1901

Domestic Orders Only

Year	Locomotives	Year	Locomotives
1901	4,340	1908	1,182
1902	4,665	1909	3,350
1903	3,283	1910	3,787
1904	2,538	1911	2,850
1905	6,265	1912	4,515
1906	5,642	1913	3,467
1907	3,482	1914	1,265

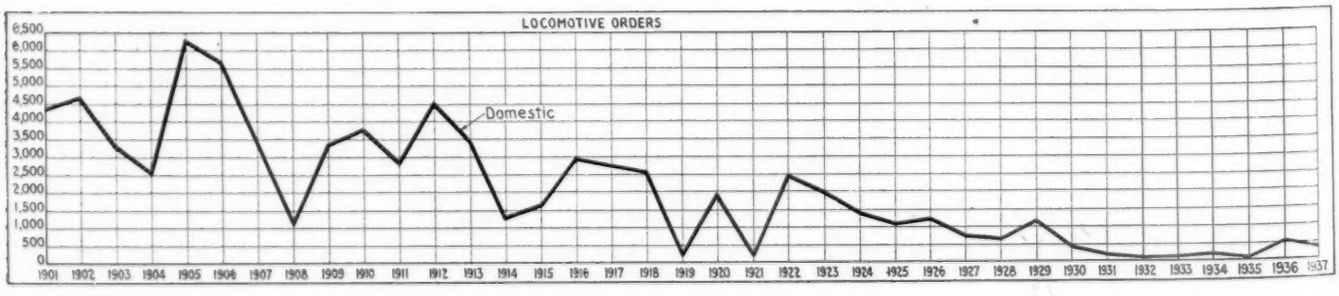
Domestic and Foreign

Year	Domestic	Canadian	U. S. Export	Total
1915	1,612	...	850	2,462
1916	2,910	...	2,983	5,893
1917	2,704	...	3,438	6,142
1918	2,593	209	2,086	4,888
1919	214	58	898	1,170
1920	1,998	189	718	2,905
1921	239	35	546	820
1922	2,600	68	131	2,799
1923	1,944	82	116	2,142
1924	1,413	71	142	1,626
1925	1,055	10	209	1,274
1926	1,301	61	180	1,542
1927	734	58	54	846
1928	603	98	27	728
1929	1,212	77	106	1,395
1930	440	95	20	555
1931	176	2	28	206
1932	12	1 (Export)	1	14
1933	42	...	7	49
1934	183	...	17	200
1935	87*	27	15	129*
1936	533	1	22	556
1937	368	57 (Inc. Exp.)	56	481

Prior to 1918, Canadian orders included under "Domestic."
* Revised to include locomotives for articulated or partially articulated trains.

Second in rank of total orders was the Atchison, Topeka & Santa Fe purchase of 17 Diesel-electric locomotives, which is also the largest total in this class of power for the year. Other outstanding orders include that of the Pennsylvania for 13 electric locomotives and that of the Elgin, Joliet & Eastern for 13 Diesel-electric units.

During 1937 builders in the United States received



Locomotive Orders from 1901 to 1937

orders from foreign buyers for 56 locomotives—45 steam, 2 electric and 9 Diesel-electric and others. This represents the best export business since 1929, when 106 locomotives were ordered for export, and is more than twice 1936's total of 22.

Canadian builders enjoyed the heaviest volume of orders since 1930. The total number of locomotives ordered, 57, were all steam, five of which were for export. This figure is almost twice the combined totals of orders for every year since 1930, inasmuch as Canadian locomotive plants received orders for only 1 locomotive in 1932 and 1936, 2 in 1931, and 27 in 1935. They received no orders in either 1933 or 1934.

Locomotives *built* during 1937 for domestic service in the United States, as distinguished from those *ordered*, totaled 526—317 steam, 43 electric and 166 Diesel-electric and other types,—as compared with a total of 157 in 1936 and 184 in 1935. More specifically, the production volume for 1937 is more than three times that of 1936. Locomotives built for export totaled 44—29 steam, 7 electric and 8 Diesel-electric,—as compared with a total of 22 for 1936. Canadian builders had a production of 45 locomotives during the year, two of which were for export, which total lacks just one of doubling the 23 locomotives built in Canada during 1936.

The distinction between locomotives ordered and the number built is important to an understanding of these statistics. A locomotive is under construction for several months and thus locomotive production figures for any year naturally include some units which were ordered during the closing months of the year previous to that under review. It is this overlap from year to year that results in a total production figure different from the total ordered. Also, while the factor has been unimportant in recent years, it should nevertheless again be pointed out, to those comparing the more recent with the more remote years listed in the accompanying tabulation, that modern locomotives are far more powerful and far more costly than those of the days when yearly orders totaled thousands.

The Car Service Division of the Association of American Railroads reports monthly totals of locomotive installations and retirements. These figures do not agree with the *Railway Age* totals of locomotives ordered or built, because the Car Service Division total covers only Class I carriers, whereas the *Railway Age* figures cover all carriers, and also industrial users.

The details in the appended list of locomotive orders were supplied by railways and other purchasers in response to inquiries from the *Railway Age*. They were checked against similar lists furnished through the cooperation of the builders, and amplified by reference to the weekly reports in the Equipment and Supplies column of the *Railway Age*. The *Railway Age* does not desire to make any claims as to the scientifically statistical accuracy of the tables, or totals drawn from them. However, the real purpose of the statistics is to allow comparisons of the year's business with that of other years, which purpose it is believed they serve with entire adequacy.

Table III—Locomotives Built in 1937

	United States	Canada	Total
Domestic	526	43	569
Foreign	44	2	46
Total	570	45	615

Comparison with Previous Years

Year	Domestic	Foreign	Total	Year	Domestic	Foreign	Total
1896	866	309	1,175	1913†	4,561	771	5,332
1897	865	386	1,251	1914†	1,962	273	2,235
1898	1,321	554	1,875	1915†	1,250	835	2,085
1899	1,961	514	2,475	1916‡	2,708	1,367	4,075
1900	2,648	505	3,153	1917†	2,585	2,861	5,446
1901	....	....	3,384	1918†	3,668	2,807	6,475
1902	....	....	4,070	1919†	2,162	1,110	3,272
1903	....	....	5,152	1920†	2,022	1,650	3,672
1904	....	....	3,441	1921†	1,185	638	1,823
1905*	4,896	595	5,491	1922†	1,303	231	1,534
1906*	6,232	720	6,952	1923†	3,505	280	3,785
1907*	6,564	798	7,362	1924†	1,810	226	2,036
1908*	1,886	456	2,342	1925†	994	291	1,285
1909*	2,596	291	2,887	1926†	1,585	185	1,770
1910*	4,441	314	4,755	1927†	1,009	167	1,176
1911*	3,143	387	3,530	1928†	636	111	747
1912†	4,403	512	4,915				

* Includes Canadian output.
† Includes Canadian output and equipment built in railroad shops.

	United States			Canada			Grand
	Domestic	Foreign	Total	Domestic	Foreign	Total	total
1929	926	139	1,065	96	..	96	1,161
1930	972	51	1,023	111	..	111	1,134
1931	181	17	198	24	..	24	222
1932	102	18	120	2	1	3	123
1933	57	6	63	..	..	..	63
1934	91	19	110	..	..	..	110
1935	184	17	201	4	..	4	205
1936	157	22	179	23	..	23	202
1937	526	44	570	43	2	45	615

Steam Locomotive Orders in 1937

For Service in the United States

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Aliquippa & Southern	2	0-8-0	Sw.	231,500	58,300	25 x 28	March	August	American
Alton & Southern	1	2-8-2	Freight	278,500	55,000	25 x 30	June	November	American
Atlantic Coast Line	12	4-8-4	Pass.	460,000	63,900	27 x 30	April	.....	Baldwin
Baltimore & Ohio	1	4-8-4	Pass.	400,000	72,500	4 Steam Motors	September	.....	Company Shops
Bangor & Aroostook	5	2-8-0	Freight	238,800	45,200	22¼ x 30	June	December	American
Chicago & Illinois Midland	2	0-8-0	Sw.	227,500	52,900	25 x 28	January	June	Lima
Chicago & North Western	9	4-6-4	Pass.	415,000	55,000	25 x 29	February	Jan., '38	American
Chicago, Burlington & Quincy	5	4-8-4	Freight	469,800	67,500	28 x 30	November	1938	Company Shops
Chicago, Milwaukee, St. Paul & Pacific	1	4-8-4	Freight	446.530	62,136	28 x 30	June	March, '38	Company Shops
Chicago, West Pullman & Southern	2	0-6-0	Sw.	171,800	42,000	22 x 26	March	August	Baldwin
Delaware, Lackawanna & Western	5	4-6-4	Pass.	375,000	52,790	26 x 30	January	Jan., '38	American
Georgia Railroad	1	4-6-2	Pass.	248,600	35,000	23 x 28	1937	June	Company Shops
	1	4-6-2	Pass.	248,600	35,000	23 x 28	1937	Jan., '38	Company Shops
Great Western Railway	1	2-8-0	Freight	162,000	31,200	19 x 26	April	September	American
Jones & Laughlin Steel Corp.	1	0-4-0	.....	118,000	.....	18 x 20	1937	.....	American
Mesta Machine Co.	1	Fireless	Sw.	132,000	28,170	30 x 24	October	December	H. K. Porter Co.
Newburgh & South Shore	2	0-6-0	Sw.	201,500	49,690	22 x 28	July	December	Lima
Norfolk & Western	10	2-8-8-2	Freight	582,900	126,838	25 & 39 x 32 (4 cyl)	May	Nov.-Aug., '38	Company Shops
Northern Pacific	9	4-6-6-4	Freight	624,500	104,500	23 x 32 (4 cyl)	January	May-June	American
	8	4-8-4	Pass.	484,000	69,800	28 x 31	March	Feb., '38	Baldwin
	1*	Rotary	Snow Plow	.....	.....	.....	1937	.....	American
Pere Marquette	10	2-8-4	Freight	436,500	69,350	26 x 34	February	November	Lima
	5	2-8-4	Freight	445,500	83,750†	26 x 34	February	October	Lima
	11*	Tenders	.....	131,000	.....	.....	February	October	American
Pickands Mather & Co.	1	0-6-0	.....	170,000	.....	21 x 28	February	.....	American
	1	0-8-0	Sw.	260,000	60,100	25 x 28	February	.....	Baldwin
	1	0-8-0	Sw.	260,000	60,100	25 x 28	March	.....	Baldwin

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of Order	Date of delivery	Builder
Richmond, Fredericksburg & Potomac.	6	4-8-4	Pass.	410,000	62,800	27 x 30	April	Feb., '38	Baldwin
St. Louis-San Francisco	11	4-8-2	Freight	406,580	74,850	27 x 30	.....	Jan.-Aug.	Company Shops
St. Louis Southwestern	5	4-8-4	Freight	425,500	61,564	26 x 30	.....	Oct.-Dec.	Company Shops
Shell Petroleum Corp.	1	.....	Sw.	50,000	10,085	12 x 16	September	December	Vulcan
Southern Pacific	2*	Rotary	Snow Plow	.....	.....	.....	1937	.....	American
Spokane, Portland & Seattle	6	4-6-6-4	Freight	621,000	104,500	23 x 32(4 cyl)	March	Sept.-Oct.	American
	3	4-8-4	Pass.	484,000	69,800	28 x 31	March	March, '38	Baldwin
Union Pacific	25	4-6-6-4	Freight	582,000	97,400	22 x 32(4 cyl)	January	June-Aug.	American
Weyerhaeuser Timber Co.	3	2-6-6-2	Freight	243,500	42,500	18 & 28 x 24 (4 cyl)	Dec., '36	May-June	Baldwin
Wheeling & Lake Erie	10	0-6-0	Sw.	164,900	39,102	21 x 28	April	Sept.-Jan., '38	Company Shops
White Pass & Yukon	1	2-8-2	Freight	.....	.....	.....	December	1938	Baldwin
Wisconsin Central (M.St.P.&S.S.M.)	4	4-8-4	Freight	446,000	66,000	26 x 32	March	Jan., '38	Lima
Youngstown & Northern	1	0-6-0	Sw.	203,200	49,690	22 x 28	April	August	Lima
Youngstown Sheet & Tube Co.	1	0-4-0	Sw.	186,000	.....	.....	January	February	Baldwin
	1	0-4-0	Sw.	84,000	.....	.....	March	July	Heisler
	1	0-6-0	Sw.	160,000	.....	.....	April	May	Baldwin

Canada

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Canadian Pacific	25	4-6-4	Pass.	355,000	45,250	22 x 30	February	1938	Montreal
	5	4-6-4	Pass.	366,000	57,250†	22 x 30	February	1938	Montreal
	20	4-4-4	Pass.	240,000	26,000	16½ x 28	February	1938	Canadian
Dominion Steel & Coal Co., Ltd.	1	0-4-0	.....	75,000	.....	14 x 22	August	.....	Montreal
Roberval & Saguenay	1	2-8-0	Freight	237,500	47,300	23 x 30	February	July	Canadian

Export

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Anglo-Newfoundland Dev. Co., Ltd.	1	2-6-2	Freight	134,500	19,600	16 x 22	April	.....	Baldwin
Broken Hill Proprietary Co., Ltd.	1	2-8-2	Freight	188,000	37,500	21 x 24	September	.....	Baldwin
Cuban Dominion Sales Corp.	1	2-8-0	Plantation	66,000	12,970	14 x 18	August	.....	Baldwin
Goyaz Railroad	1	2-6-6-2	Freight	148,000	29,950	14 x 22(4 cyl)	May	.....	Baldwin
Guayaquil & Quito	2	2-8-0	.....	.....	.....	.....	January	.....	Baldwin
Ministry of Rys.—Chinese Gov.	10	2-8-2	.....	205,000	.....	20 x 28	June	.....	American
	10	2-8-2	Freight	204,800	35,300	20 x 28	June	.....	Baldwin
National Rys. of Mexico	8	2-6-6-2	.....	410,000	.....	18 x 30	1937	.....	American
	10	4-6-4	.....	300,000	.....	22½ x 28	1937	.....	American
Santa Barbara Vigia	1	2-4-4	Pass. & Fgt.	52,000	6,000	9 x 16	February	.....	Baldwin

Canada — Export

Purchaser	No.	Type	Service	Weight	Tractive force	Cylinders	Date of order	Date of delivery	Builder
Mexican Railway Co.	3	4-6-2	Pass.	250,000	.....	20 x 28 (3 cyl)	December	.....	Montreal
Trinidad Government Rys.	2	2-8-0	.....	112,000	.....	16 x 24	1937	.....	Montreal

* Not included in totals.
† Tractive force including booster.

Electric Locomotives

For Service in the United States

Purchaser	No.	Wheel arrangement	Service	Weight	Horse-power	Date of order	Date of delivery	Builder Electrical Equipment—Locomotive
American Smelting & Ref. Co.	1	B	.....	49,500	150	September	.....	West.-Baldwin
Calumet Fuel Co.	1	B	.....	27,000	150	April	.....	West.-Baldwin
Ebensburg Coal Co.	2	B	.....	31,500	180	March	.....	West.-Baldwin
Koppers Co.	1	B	Quencher	46,000	150	February	.....	West.-Baldwin
New York, New Haven & Hartford	6	2-C+C-2	Pass.	432,000	3,600	May	Mar., '38	General Electric
Niagara Junction	1	B-B	Freight	120,000	560	January	August	West.-Baldwin
Pennsylvania	11	2-C+C-2	Pass.	460,000	....	April	Dec.-Feb., '38	West.-G. E.-Co. Sh.
	2	B	Sw.	80,000	180	May	November	G. E.-Atlas
Phelps-Dodge Corp.	1	B	.....	41,000	150	October	.....	West.-Baldwin
Potash Co. of America	1	B	.....	31,300	180	March	.....	West.-Baldwin
Utah Copper Co.	7	B+B	Sw.	170,000	970	March	October	General Electric
Waterloo, Cedar Falls & Northern	1	B-B	Freight	130,000	800	October	.....	G. E.-American
Woodward Iron Co.	1	B	.....	34,500	260	August	.....	West.-Baldwin

Export

Purchaser	No.	Wheel arrangement	Service	Weight	Horse-power	Date of order	Date of delivery	Builder Electrical Equipment—Locomotive
Chile Exploration Co.	2	B+B	Sw.	160,000	660	January	June	General Electric

Diesel-Electric, Gas-Electric and Other Internal-Combustion Locomotives

For Service in the United States

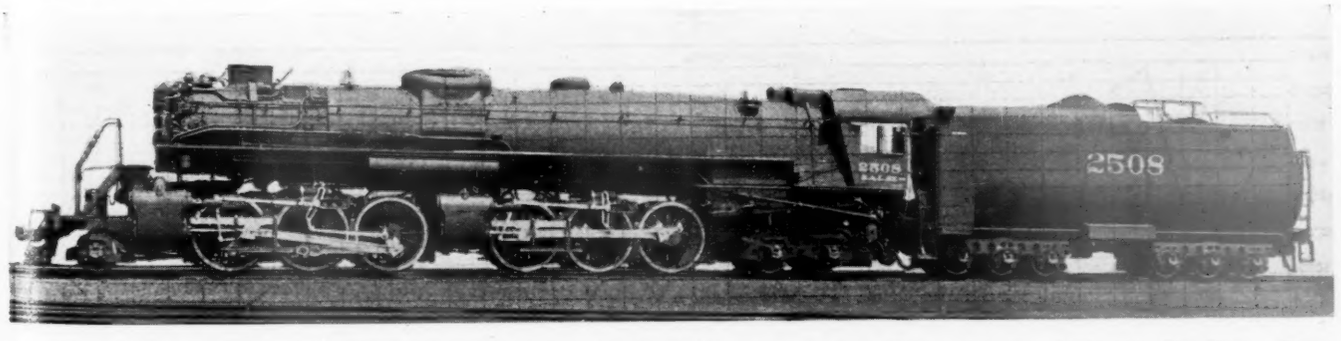
Purchaser	No.	Wheel arrange-ment	Service	Type	Weight	Horse-power	Date of order	Date of delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
American Car & Fdy. Co.	1	B	Sw.	Gas-Mech.	70,000	250	April	April	Plymouth-LeRoi
	1	B	Sw.	Gas-Mech.	70,000	250	May	July	Plymouth-LeRoi
Atchison, Topeka & Santa Fe	2	B-B	Sw.	Diesel-Elec.	.....	600	June	July	American
	1	B-B	Sw.	Diesel-Elec.	.....	660	June	June	Allis C.-Bald.-De La V
	3	B-B	Sw.	Diesel-Elec.	200,000	600	June	July	G.E.-Electro-M.-G.M.
	3	B-B	Sw.	Diesel-Elec.	250,000	900	June	September	West.-Electro-M.-G.M.
	1‡	C-C	Pass.	Diesel-Elec.	565,000	3,600	March	1937	G.E.-Electro-M.-G.M.
	2‡	C-C	Pass.	Diesel-Elec.	565,000	3,600	August	1938	G.E.-Electro-M.-G.M.
	5‡	C-C	Pass.	Diesel-Elec.	285,000	1,800	August	1938	G.E.-Electro-M.-G.M.
Bethlehem Steel Co.	1	B	Sw.	Gas-Mech.	50,000	175	January	January	Plymouth-LeRoi
	2	B	Sw.	Diesel-Mech.	70,000	160	September	.....	Whit.-Caterpillar
Bonne Terre Farming	1	B	Sw.	Diesel-Mech.	50,000	175	August	October	Plymouth-Caterpillar

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of order	Date of delivery	BUILDER Electrical Equipment-Locomotive Builder-Engine Builder
Buckeye Steel Castings Co.	1	C	Sw.	Gas-Mech.	70,000	250	Dec., '36	February	Plymouth-LeRoi
Canton Railroad	1	B-B	Sw.	Diesel-Elec.	200,000	600	January	January	G.E.-Electro-M.-G.M.
Carnegie-Illinois Steel Corp.	1	C	Sw.	Gas-Mech.	70,000	250	January	March	Plymouth-LeRoi
	1	B	Sw.	Gas-Mech.	32,000	122	May	August	Whitcomb-Hercules
Chicago, Burlington & Quincy ..	6	B-B	Sw.	Diesel-Elec.	200,000	600	September	October	G.E.-Electro-M.-G.M.
	2	B-B	Sw.	Diesel-Elec.	250,000	900	September	December	G.E.-Electro-M.-G.M.
Baltimore & Ohio	1‡	2(C-C)	Pass.	Oil-Elec.	570,600	3,600	June	December	West.-Electro-M.-G.M.
	1‡	2(C-C)	Pass.	Oil-Elec.	570,600	3,600	October	.....	West.-Electro-M.-G.M.
Chicago, Rock Island & Pacific..	11	B-B	Sw.	Diesel-Elec.	200,000	600	Apr.-Aug.	May-Aug.	G.E.-Electro-M.-G.M.
DuPont de Nemours Co., E. I....	1	B	Sw.	Diesel-Mech.	60,000	175	June	September	Plymouth-Caterpillar
East Erie Com. R. R.	1	B-B	Sw.	Diesel-Elec.	120,000	300	March	September	G.E.-Cooper-Bessemer
Elgin, Joliet & Eastern	6	B-B	Sw.	Diesel-Elec.	200,000	600	Nov., '36	January	G.E.-Electro-M.-G.M.
	1	B-B	Sw.	Diesel-Elec.	202,800	600	July	September	American
	1	B-B	Sw.	Diesel-Elec.	254,800	900	July	November	American
	3	B-B	Sw.	Diesel-Elec.	202,800	600	July	September	G.E.-Electro-M.-G.M.
	2	B-B	Sw.	Diesel-Elec.	254,800	900	July	November	G.E.-Electro-M.-G.M.
Ford Motor Co.	2	B-B	Sw.	Diesel-Elec.	250,000	1,000	March	September	G.E.-Cooper-Bessemer
Ft. Worth & Denver City	1	B-B	Sw.	Diesel-Elec.	180,000	1,000	August	October	G.E.-Cummins
Great Lakes Steel Corporation ..	2	B-B	Sw.	Diesel-Elec.	200,000	600	May	June	G.E.-Electro-M.-G.M.
Great Northern	2	B-B	Sw.	Diesel-Elec.	250,000	900	October	December	G.E.-Electro-M.-G.M.
Inland Steel Company	2	B-B	Sw.	Diesel-Elec.	200,000	600	February	March	G.E.-Electro-M.-G.M.
	2	B-B	Sw.	Diesel-Elec.	200,000	600	April	July	G.E.-Electro-M.-G.M.
Kaiser Co., Henry J.	1	B	Sw.	Diesel-Mech.	50,000	175	Nov., '36	March	Plymouth-Caterpillar
Lehigh Valley	2	B-B	Sw.	Diesel-Elec.	200,000	600	August	August	G.E.-Electro-M.-G.M.
	2	B-B	Sw.	Diesel-Elec.	250,000	900	August	December	G.E.-Electro-M.-G.M.
	2	B-B	Sw.	Diesel-Elec.	250,000	900	August	May, '38	G.E.-Electro-M.-G.M.
Michigan Block Corp.	1	B	Sw.	Gas-Mech.	24,000	107	September	.....	Whit.-Hercules
Michigan Limestone & Chem. Co.	2	B-B	Quarry	Diesel-Elec.	200,000	600	January	May	Gen. Elec.-Amer.
Midvale Co.	1	B	Sw.	Diesel-Elec.	50,000	210	April	.....	West.-Whit.-De La V.
Milwaukee Coke & Gas Co.	1	B-B	Sw.	Diesel-Elec.	130,000	400	April	November	G.E.-Ing. Rand
Missouri Pacific	4	B-B	Sw.	Diesel-Elec.	200,000	600	March	July	G.E.-Electro-M.-G.M.
	2	B-B	Sw.	Diesel-Elec.	250,000	900	March	July	West.-Electro-M.-G.M.
Monongehela Connetcing	1‡	B-B	Sw.	Oil-Elec.	166,500	600	February	July	G.E.-Cooper-Bessemer
	1‡	B-B	Sw.	Oil-Elec.	167,400	600	February	August	G.E.-Cooper-Bessemer
Muncie & Western	1	C	Sw.	Gas-Mech.	70,000	250	February	March	Plymouth-LeRoi
Narragansett Pier R. R.	1	B	Sw.	Gas-Mech.	60,000	175	May	June	Plymouth-LeRoi
Newark Tidewater Terminal	1	B	Sw.	Gas-Mech.	40,000	156	March	May	Whitcomb-Climax
New Orleans Public Belt	3	B-B	Sw.	Diesel-Elec.	240,000	900	January	December	West.-Bald.-De La V.
New York State Rwys.	1	B	Sw.	Gas-Mech.	70,000	250	October	November	Plymouth-LeRoi
Northampton & Bath	1	B-B	Sw.	Diesel-Elec.	266,000	1,600	May	May	West.-Bethlehem
Ontario Paper	1	C	Sw.	Diesel-Mech.	70,000	250	January	March	Plymouth-Cummins
Patapsco & Back Rivers	3	B-B	Sw.	Diesel-Elec.	200,000	600	Dec., '36	January	G.E.-Electro-M.-G.M.
	2	B-B	Sw.	Diesel-Elec.	200,000	600	July	September	G.E.-Electro-M.-G.M.
	1	B-B	Sw.	Diesel-Elec.	200,000	600	March	April	West.-G.E.-American
	6	B-B	Sw.	Diesel-Elec.	200,000	600	June	Aug.-Nov.	West.-G.E.-American
Pennsylvania	1	B-B	Sw.	Diesel-Elec.	200,000	600	June	August	G.E.-Electro-M.-G.M.
Phoenix Engineering Corp.	1	B	Sw.	Gas-Mech.	60,000	175	February	February	Plymouth-LeRoi
Phila., Bethlehem & New England	1	..	...	Diesel-Elec.	.....	900	Oct., '36	.....	Electro-Motive
	3	B-B	Sw.	Diesel-Elec.	200,000	600	Dec., '36	January	G.E.-Electro-M.-G.M.
	2	B-B	Sw.	Diesel-Elec.	250,000	900	July	September	West.-Electro-M.-G.M.
	2	B-B	Sw.	Diesel-Elec.	250,000	900	June	July	G.E.-Electro-M.-G.M.
Pittsburgh Plate Glass Co.	1	C	Sw.	Gas-Mech.	70,000	250	February	March	Plymouth-LeRoi
Reading Co.	6	B-B	Sw.	Diesel-Elec.	200,000	600	November	November	G.E.-Electro-M.-G.M.
	2	B-B	Sw.	Diesel-Elec.	230,000	900	November	December	G.E.-American
River Terminal	1	B-B	Sw.	Diesel-Elec.	200,000	600	January	February	G.E.-Electro-M.-G.M.
Roebling's Sons Co., John A. ...	1	B	Sw.	Diesel-Mech.	60,000	160	January	May	Whit.-Caterpillar
South Buffalo Ry.	1	B-B	Sw.	Diesel-Elec.	200,000	900	March	March	G.E.-American
	2	B-B	Sw.	Diesel-Elec.	200,000	600	March	April	G.E.-American
	6	B-B	Sw.	Diesel-Elec.	200,000	600	June	Aug.-Nov.	G.E.-American
Steelton & Highspire	1	B-B	Sw.	Diesel-Elec.	200,000	600	July	August	G.E.-Electro-M.-G.M.
Sumpter Valley	1	B	Sw.	Diesel-Mech.	60,000	170	June	April	Dav.-Besler-Cater.
Union Pacific	1	B	Sw.	Gas-Mech.	40,000	169	July	October	Whitcomb-LeRoi
U. S. Naval Training Station ...	1	B	Sw.	Gas-Mech.	40,000	175	August	September	Plymouth-LeRoi
Vanadium Corp. of America	1	B	Sw.	Gas-Mech.	50,000	169	March	July	Whitcomb-LeRoi
Winona R. R.	1	C	Sw.	Propane-Mech.	70,000	250	March	May	Plymouth-LeRoi
	1	B-B	Frt. & Sw.	Propane-Elec.	140,000	600	Dec., '36	July	West.--Plym.-LeRoi
Youngstown & Northern	2	B-B	Sw.	Diesel-Elec.	250,000	900	March	May	West.-Electro-M.-G.M.
	2	B-B	Sw.	Diesel-Elec.	233,500	900	March	October	G.E.-American

Export

Purchaser	No.	Wheel arrangement	Service	Type	Weight	Horsepower	Date of order	Date of delivery	Builder Electrical Equipment-Locomotive Builder-Engine Builder
Cementos Hidalgo	1	B	Sw.	Diesel-Mech.	16,000	125	June	September	Midwest-Cummins
Central Constancia	1	B	Sw.	Diesel-Mech.	24,000	130	July	September	Whit.-Caterpillar
Central Juanita, Inc.	1	B	Sw.	Diesel-Mech.	24,000	107	September	.....	Whitcomb-Cummins
Kauai Terminal, Inc.	1	B	Sw.	Diesel-Elec.	20,000	103	March	July	G.E.-Whit.-Hercules
Loiza Sugar Co.	1	B	...	Diesel-Mech.	24,000	125	October	December	Midwest-Cummins
Pierce Oil	1	B	Sw.	Kero.-Mech.	60,000	225	Dec., '36	May	Midwest-Climax
United Fruit	1	C	...	Diesel-Mech.	28,000	125	January	July	Midwest-Cummins
	1	B	...	Diesel-Mech.	16,000	125	June	July	Midwest-Cummins
	1	..	...	Diesel-Elec.	.....	300	August	.....	American

‡ Each of two units.



One of Five Single Expansion Articulated Locomotives Built by the Baldwin Locomotive Works for the Seaboard Air Line. These Locomotives Develop 82,300 Lb. Tractive Force

Freight Cars Ordered in 1937

Total of 52,738 exceeds volume for each year 1930-1935 but falls below 1936 figures; exports and Canada show spurt

By Frank W. Kraeger
Associate Editor

THE domestic freight car market for 1937 failed to fulfill hopes expressed during early months that it would far exceed the volume of orders reached in 1936. Cars ordered during the year totaled 52,738, which figure falls short of the 1936 volume by 14,806 cars. Thus ends a year which started out much more actively. During the first quarter, it may be recalled, more freight car orders were placed than in each of the entire years 1931 to 1935, inclusive, and more than three times the volume of orders of the corresponding quarter of 1936. Activity was still substantial at the end of its first half, when already 45,090 cars had been ordered, a number 60 per cent in excess of the cars ordered during the first half of 1936. Even at that point, however, a recession in the car market had begun and it continued to the end of the year to register slim monthly totals.

Of the total volume of orders, company shops received 14,926, or approximately 28 per cent. Outside builders thus received a decreased proportion of the total compared with 1936, when company shop orders accounted for but 20 per cent of the whole. In 1935, however, commercial car manufacturers received only 60 per cent of the total orders.

Table I—Freight Car Orders in 1937

For service in the United States	52,738
For service in Canada	7,397
For export to other countries	1,369
Grand total	61,504

The distinction of buying the greatest number of freight cars during 1937 falls to the Illinois Central which placed orders for a total of 4,100 cars. The Baltimore & Ohio is a close "runner-up," having purchased 4,000 cars. Other large purchasers included: Union Pacific, 3,900; Cincinnati, New Orleans & Texas Pacific, 3,537; Louisville & Nashville, 3,027; Pennsylvania, 2,800.

Export orders for the year compare far better with 1936 figures than does domestic volume. Foreign purchasers placed orders for 1,369 freight cars in 1937 as compared with 526 cars in 1936, which constitutes an increase in volume of over 160 per cent. Upon further comparison, it will be seen that 1937 is the best export year since 1929.

The Canadian freight car market shows by far the greatest improvement over previous years. The Cana-

Table II—Orders for Freight Cars Since 1901

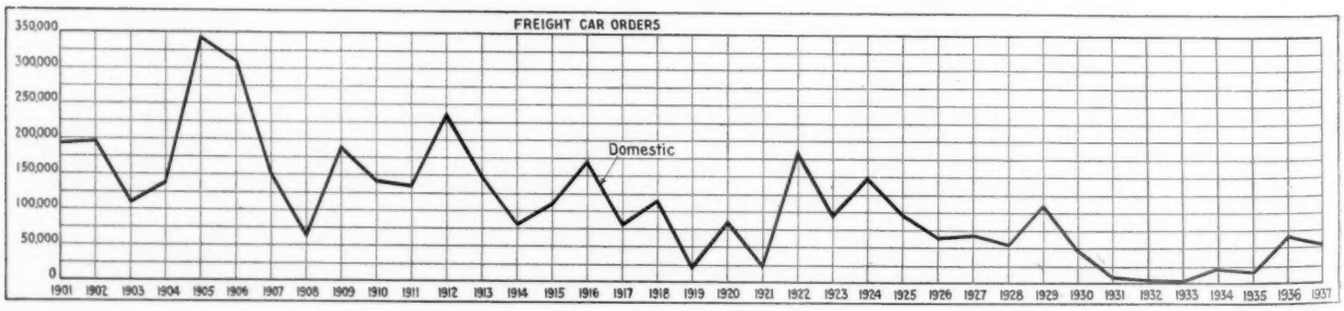
DOMESTIC ORDERS

Year	Freight cars	Year	Freight cars
1901	193,439	1908	62,669
1902	195,248	1909	189,360
1903	108,936	1910	141,024
1904	136,561	1911	133,117
1905	341,315	1912	234,758
1906	310,315	1913	146,732
1907	151,711	1914	80,264

DOMESTIC AND FOREIGN

Year	Domestic	Canadian	Export	Total
1915	109,792	.....	18,222	128,014
1916	170,054	.....	35,314	205,368
1917	79,367	.....	53,191	132,558
1918	114,113	9,657	53,547	177,317
1919	22,062	3,837	3,994	29,893
1920	84,207	12,406	9,056	105,669
1921	23,346	30	4,982	28,358
1922	180,154	746	1,072	181,972
1923	94,471	8,685	396	103,552
1924	143,728	1,867	4,017	149,612
1925	92,816	642	2,138	95,596
1926	67,029	1,495	1,971	70,495
1927	72,006	2,133	646	74,785
1928	51,200	8,901	2,530	62,631
1929	111,218	9,899	3,023	124,140
1930	46,360	1,936	1,200	49,496
1931	10,880	3,807	151	14,838
1932	1,968	501	77	2,546
1933	1,685	75	132	1,892
1934	24,611	12	1,323	25,946
1935	18,699	2,421	110	21,230
1936	67,544	271	526	68,341
1937	52,738	7,397	1,639	61,504

Prior to 1918, Canadian orders included in "Domestic."



Freight Car Orders from 1901 to 1937

dian carriers ordered 7,397 freight cars during 1937, which figure exceeds the combined orders placed during the years 1931 to 1936, inclusive, and is the best volume of business since 1929.

Freight cars built during 1937 for domestic service in the United States, as distinguished from cars ordered, totaled 75,003, as compared with 45,822 built during 1936. American builders completed 1,121 cars for export during the year, or more than twice the number built for the 1936 export market. Canadian builders completed 6,595 cars during the year or more than three and a half times the number built during 1936.

The foregoing production figures should not be confused with the totals of orders placed. Nor are they comparable with the figures on the number of cars in-

(*Continued on page 87*)

Table III—Freight Cars Built in 1937

	United States	Canada	Total
Domestic	75,003	6,595	81,598
Foreign	1,121	....	1,121
Total	76,124	6,595	82,719

Comparison with Previous Years

Year	Domestic	Foreign	Total	Year	Domestic	Foreign	Total
1899	117,982	1,904	119,886	1906*	236,451	7,219	240,503
1900	113,070	2,561	115,631	1907*	280,216	9,429	284,188
1901	132,591	4,359	136,950	1908*	75,344	1,211	76,555
1902	161,747	2,800	162,599	1909*	91,077	2,493	93,570
1903	153,195	1,613	152,801	1910*	176,374	4,571	180,945
1904	60,955	1,995	60,806	1911*	68,961	3,200	72,161
1905*	162,701	5,305	165,155	1912†	148,357	4,072	152,429

	United States			Canadian			
Year	Domestic	Foreign	Total	Domestic	Foreign	Total	Grand total
1913	176,049	9,618	185,667	22,017	....	22,017	207,684
1914	97,626	462	98,088	6,453	....	6,453	104,451
1915	58,226	11,916	70,142	1,758	2,212	3,970	74,112
1916	111,516	17,905	129,421	.....	....	5,580	135,001
1917	115,705	23,938	139,643	3,658	8,100	11,758	151,401
1918	67,063	40,981	108,044	14,704	1,960	16,664	124,708
1919	94,981	61,783	156,764	6,391	30	6,421	163,185
1920	60,955	14,480	75,435	.....	....	.....	.....
1921	40,292	6,412	46,704	8,404	745	9,149	55,853
1922	66,289	1,126	67,415	458	100	558	67,973
1923	175,748	2,418	178,166	.....	....	.....	.....
1924	113,761	1,141	114,902	1,721	....	1,721	116,623
1925	105,935	3,010	108,945	.....	....	.....	.....
1926	88,862	2,771	91,633	1,645	....	1,645	93,278
1927	63,390	1,087	64,477	2,851	....	2,851	67,328
1928	46,060	938	46,998	5,158	....	5,158	52,156
1929	82,240	3,168	85,408	8,557	....	8,557	93,965
1930	75,188	1,909	77,097	6,923	....	6,923	84,020
1931	13,205	409	13,614	4,633	....	4,633	18,247
1932	3,254	82	3,336	.....	....	.....	3,336
1933	2,160	151	2,311	550	....	550	2,861
1934	25,176	151	25,327	.....	....	.....	25,327
1935	6,933	888	7,821	801	....	801	8,622
1936	45,822	493	46,315	1,800	....	1,800	48,115
1937	75,003	1,121	76,124	6,595	....	6,595	82,719

* Includes Canadian output.
† Includes Canadian output and equipment built in company shops.

Freight Car Orders in 1937

For Service in the United States

Purchaser	No.	Class	Capacity	Length, ft.	Length, in.	Construction	Weight	Date of order	Date of delivery	Builder
Acar Mfg. Co.	1	Tank	10,000g	37	6¾	Steel	50,600	May	September	Amer. Car & Fdy.
Alabama Great Southern	1022	S. S. Box	80,000	40	6	Steel	44,500	April	October	Pullman-Standard
	250	L. S. Gondola	100,000	41	6	Steel	40,700	April	Nov.-Dec.	Pullman-Standard
	250	D. B. Gondola	100,000	41	9	Steel	46,300	April	October	Amer. Car & Fdy.
	600	Hopper	100,000	33	0	Steel	42,700	April	Oct.-Nov.	Pressed Steel
Aliquippa & Southern	20	Pack	200,000	36	6	Steel	52,600	April	December	Company Shops
Alton & Southern	3	Caboose	.....	..	..	.....	.....	1937	1937	Company Shops
Aluminum Company of America	25	Hopper	.....	..	..	.....	.....	Dec., '36	1937	Pullman-Standard
Atlanta & W. P.-West'n Ry. of Ala.	20	S. S. Box	100,000	50	6	Steel	51,000	1937	Nov.-Dec.	Company Shops
Atlantic Coast Line	100	Phosphate	140,000	35	9¾	Steel	50,554	April	Oct.-Nov.	Bethlehem
	100	Furn. Auto	100,000	50	6	Steel	.....	April	Jan.-Feb., '38	Mount Vernon
	100	D. S. Auto	100,000	40	6	Steel	.....	April	Jan.-Feb., '38	Mount Vernon
	400	D. S. Auto	100,000	40	6	Steel	.....	April	Jan.-Feb., '38	Mount Vernon
Aycock Company, R. L.	15	Tank	4,000g	..	..	Steel	.....	January	March	General American
Baker Castor Oil Co.	1	Tank	8,000g	..	..	.....	.....	June	September	General American
	1	Tank	6,000g	..	..	.....	.....	March	April	General American
Baltimore & Ohio	1450	Gondola	140,000	52	6	Steel	54,200	January	May	Bethlehem
	550	Gondola	140,000	65	6	Steel	61,400	January	May	Bethlehem
	2000	Box	100,000	40	6½	Steel	46,500	January	1937	Company Shops
Barrett Company	1	Tank	6,000g	..	..	.....	.....	October	December	General American
	1	Tank	6,000g	..	..	.....	.....	October	Jan. '38	General American
	3	Tank	6,000g	..	..	.....	.....	October	December	General American
	1	Tank	4,000g	..	..	.....	.....	October	December	General American
	2	Tank	4,000g	..	..	.....	.....	October	December	General American
	7	Tank	6,000g	..	..	.....	.....	October	Nov.-Dec.	General American
Bay Chemical Co.	2	Tank	8,000g	..	..	.....	.....	March	August	General American
	1	Tank	6,000g	..	..	.....	.....	March	September	General American
Bessemer & Lake Erie	2	Hopper	180,000	40	8	Steel Cor-Ten	48,700	February	May-July	Pullman-Standard
Bethlehem Steel Company	50	Flat	140,000	36	0	Steel	45,000	January	September	Company Shops
	25	Flat	100,000	40	0	Steel	37,100	January	August	Company Shops
Bingham & Garfield	1	D. S. Caboose	60,000	19	0	Steel Frame	37,700	August	December	Pac. Car & Fdy.
Birmingham Southern	25	Gondola	140,000	65	0	Steel	60,500	Dec. '36	May	Pullman-Standard
Buffalo Electro-Chem. Co.	1	Tank	4,000g	..	..	Steel	.....	February	July	General American
	1	Tank	8,000g	..	..	.....	.....	March	September	General American
Burlington Refrigerator Exp. Co.	270	Refrigerator	75,000	33	2¾	Steel	54,500	January	September	Company Shops
Butte Anaconda & Pacific	4	Flat	.....	..	..	.....	.....	1937	1937	Company Shops
Cabot, Inc., Godfrey L.	20	Hopper	70,000	45	10½	Steel	51,000	July	August	Amer. Car & Fdy.
California Dispatch Line	2	Tank	8,000g	39	1½	Steel	57,100	January	March	Amer. Car & Fdy.
	3	Tank	6,000g	33	4	Steel	49,900	February	May	Amer. Car & Fdy.
	2	Tank	8,000g	39	1½	Steel	57,100	February	May	Amer. Car & Fdy.
	1	Tank	8,000g	39	1½	Steel	56,100	March	June	Amer. Car & Fdy.
	10	Tank	.....	..	..	Steel	.....	January	1937	General American
Cambria & Indiana	300	Hopper	100,000	33	0	Steel	42,000	July	Nov.-Dec.	Amer. Car & Fdy.
	500	Hopper	100,000	33	0	Steel	42,000	July	Nov.-Dec.	Bethlehem
Canfield Tank Line	2	Tank	4,000g	..	..	.....	.....	February	April	General American
	3	Tank	4,500g	..	..	.....	.....	February	April	General American
	5	Tank	8,000g	..	..	.....	.....	February	April	General American
Carbide & Carbon Chemical Corp.	2	Tank	8,000g	37	3¾	Steel	36,200	January	March	Amer. Car & Fdy.
	5	Tank	8,000g	37	3¾	Aluminum	36,400	February	June	Amer. Car & Fdy.
	5	Tank	8,000g	..	..	.....	.....	February	May-June	General American
Central of Georgia	500	D. S. Box	80,000	40	6	Steel	42,200	March	Sept.-Oct.	Pullman-Standard
	100	D. S. Box	100,000	50	6	Steel	53,400	March	November	Amer. Car & Fdy.
Champion Paper & Fibre	1	Tank	8,000g	36	3	Steel	43,500	April	June	Amer. Car & Fdy.
	2	Tank	8,000g	36	3	Steel	43,500	August	September	Amer. Car & Fdy.
Chesapeake & Ohio	25	D. B. Hopper	140,000	29	3	Steel	52,100	Dec. '36	June	Amer. Car & Fdy.
	50	S. D. Stock	80,000	40	6	Steel Frame	44,000	Dec. '36	July	Greenville
Chicago & Illinois Midland	100	Hopper	100,000	34	9	Steel	45,500	April	June-July	Pullman-Standard
	100	Gondola	140,000	46	6	Steel	55,400	April	July-Aug.	Pullman-Standard
Chicago & North Western	500	Hopper	140,000	39	0	Steel	51,800	Dec., '36	January	Pressed Steel
	200	Auto	100,000	50	6	Steel	56,100	Dec., '36	January	Mount Vernon
	300	Auto	100,000	50	6	Steel	51,200	Dec., '36	July	Mount Vernon
	150	Ballast	100,000	33	1	Steel	47,600	January	June	Rodger-A. C. & F.
	36	Caboose	.....	..	..	St. Underframe	.....	1937	1937	Company Shops
	16	Drovers	.....	..	..	St. Underframe	.....	1937	1937	Company Shops

Purchaser	No.	Class	Capacity	Length, ft.	Length, in.	Construction	Weight	Date of order	Date of delivery	Builder
Chicago, Burlington & Quincy....	300	Gondola	100,000	41	6	Composite	.....	December	1938	Company Shops
	100	Hopper	110,000	34	3	Steel	.....	December	1938	Company Shops
	250	Auto	100,000	50	6	Steel Frame	.....	December	1938	Company Shops
	600	Box	100,000	40	6	Steel Frame	.....	December	1938	Company Shops
	100	H. S. Ballast	100,000	33	2	Steel	.....	December	1938	Company Shops
	15	M.T.Gondola	140,000	65	6	Steel	60,500	.....	May	Company Shops
	25	Gondola	140,000	65	6	Steel	60,500	February	April	Pullman-Standard
Chicago, Milw., St. Paul & Pacific	50	Hopper	100,000	33	0	Steel	41,000	March	July	Company Shops
	450	Hopper	100,000	33	0	Steel	40,500	March	August	Company Shops
	500	Auto	100,000	50	6	Steel	48,600	March	November	Company Shops
	1000	Gondola	140,000	48	6	Steel Frame	53,000	September	1938	Company Shops
Chicago Great Western.....	200	Hopper	140,000	41	3	Steel	52,900	Dec. '36	March	Pullman-Standard
Cincinnati, N. O. & Tex. Pacific..	500	S. S. Auto	80,000	40	6	Steel	50,500	April	Oct.-Nov.	Mount Vernon
	500	S. S. Box	80,000	40	6	Steel	44,500	April	December	Mount Vernon
	1037	S. S. Box	80,000	40	6	Steel	44,500	April	Nov.-Dec.	Pullman-Standard
	1000	D. B. Gondola	100,000	41	9	Steel	46,300	April	Nov.-Dec.	Amer. Car & Fdy.
	500	Hopper	100,000	33	0	Steel	42,700	April	November	Pressed Steel
Clinchfield	600	Hopper	100,000	33	0	Steel	41,600	January	August	Amer. Car & Fdy.
	250	Gondola	100,000	40	6	Steel	44,500	January	September	Amer. Car & Fdy.
	250	D. S. Box	100,000	40	6	Steel	44,700	January	August	Greenville
Colorado & Southern	10	Gondola	140,000	65	6	Steel	60,500	.....	April	Pullman-Standard
Columbian Gasoline Corp.....	10	Hopper	80,000	45	10½	Steel	50,000	February	July	Amer. Car & Fdy.
Consolidated Chem. Industries, Inc.	2	Tank	4,100g	28	7¾	Steel	37,400	June	August	Amer. Car & Fdy.
	4	Tank	7,000g	32	3	Steel	42,000	August	September	Amer. Car & Fdy.
	4	Tank	7,000g	32	3	Steel	42,680	November	December	Amer. Car & Fdy.
	5	Tank	7,000g	..	..	.....	.....	April	Aug.-Sept.	General American
	1	Tank	4,200g	..	..	.....	.....	April	August	General American
	1	Tank	7,000g	..	..	.....	.....	April	August	General American
Cribari & Co., B.....	1	Tank	8,000g	..	..	.....	.....	March	August	General American
	1	Tank	8,000g	..	..	.....	.....	March	August	General American
Crystal Car Line.....	25	Tank	8,000g	..	..	Steel	.....	1937	1937	General American
Delaware & Hudson.....	100	D. S. Box	80,000	40	6	Steel	41,200	May	December	Company Shops
Detroit Chemical Works.....	1	Tank	7,100g	..	..	Steel	.....	January	March	General American
	3	Tank	7,100g	..	..	.....	.....	November	Feb., '38	General American
Detroit, Toledo & Ironton.....	400	Box	100,000	40	6	Steel	50,200	April	Aug.-Sept.	Greenville
	250	S. S. Box	100,000	50	6	Steel	75,100	April	Oct.-Nov.	Bethlehem
	100	S. S. Box	100,000	50	6	Steel	54,900	April	Oct.-Nov.	Bethlehem
Dow Chemical Company.....	10	Tank	8,000g	36	3¾	Steel	45,400	April	August	Amer. Car & Fdy.
	10	Tank	8,000g	36	3¾	Steel	45,400	June	September	Amer. Car & Fdy.
Duluth, Missabe & Iron Range...	500	D. D. Ore	150,000	19	10⅞	Steel	45,000	January	Aug.-Sept.	Pressed Steel
	25	Ore	150,000	19	10⅞	Steel	43,400	October	December	Pullman-Standard
Du Pont de Nemours & Co., E. I.	1	Tank	10,000g	36	3¾	Steel	56,000	September	November	Amer. Car & Fdy.
Electro Bleaching Gas Co.....	3	Ins. Tank	80,000	34	8½	.....	65,000	March	June-July	General American
	2	Ins. Tank	80,000	33	10	.....	65,000	April	June	Amer. Car & Fdy.
	2	Ins. Tank	80,000	33	10	.....	65,000	September	December	General American
Elgin, Joliet & Eastern Ry.....	15	Hopper	100,000	28	0	Steel	42,300	May	October	Company Shops
	10	Caboose	.....	24	0	St. Underframe	.....	July	December	Company Shops
Empire Oil & Refining Co.	3	Tank	11,000g	..	..	.....	.....	February	June	General American
Escanaba & Lake Superior.....	2	Flat	80,000	41	0	Wood	29,500	January	February	Company Shops
Ethyl Gasoline Corp.	6	Tank	3,000g	31	1½	Steel	52,400	April	July	Amer. Car & Fdy.
	6	Tank	6,000g	34	6½	Steel	67,600	April	July	Amer. Car & Fdy.
	6	Tank	6,000g	34	6½	Steel	67,600	June	September	Amer. Car & Fdy.
General Chemical Co.....	4	Tank	6,570g	34	7½	Steel	69,000	March	September	Amer. Car & Fdy.
	5	Tank	58,000	..	..	.....	.....	September	Jan.-Feb., '38	General American
	5	Tank	76,000	..	..	.....	.....	September	Jan.-Feb. '38	General American
Glacier Production Co.	1	Tank	10,500g	..	..	.....	.....	.....	June-Oct.	General American
Grand Trunk Western.....	100	Gondola	140,000	50	6	Steel Frame	52,900	February	July-Aug.	Magor
	200	Auto	80,000	50	6	Steel	54,100	March	November	Pullman-Standard
	100	Refrigerator	80,000	35	2¼	St. Underframe	59,500	March	Sept.-Oct.	Pullman-Standard
Great Northern	500	D. S. Box	100,000	40	6	Steel Frame	48,500	January	August	Pullman-Standard
	500	D. S. Box	100,000	40	6	Steel Frame	48,500	January	September	Amer. Car & Fdy.
	500	Gondola	100,000	40	6	Steel	48,000	January	August	Pressed Steel
Great Western Electro Chemical..	1	Tank	60,000	..	..	Steel	.....	January	April	General American
	2	Tank	60,000	..	..	.....	.....	April	August	General American
Gulf Oil Corporation.....	2	Tank	50,000	42	7½	Steel	75,700	October	December	Amer. Car & Fdy.
Hercules Powder Co.....	1	Tank	6,000g	..	..	.....	.....	June	November	General American
	3	Tank	6,000g	..	..	.....	.....	June	November	General American
Hooker Electro Chem. Co.	1	Tank	8,000g	36	3¾	Steel	42,300	June	October	Amer. Car & Fdy.
	2	Tank	.....	..	..	Steel	.....	March	1937	General American
Huber Corp., J. M.....	3	Hopper	80,000	45	10½	Steel	50,000	March	July	Amer. Car & Fdy.
Illinois Central	500	S. S. Box	80,000	40	6	Steel Frame	48,200	January	1937	Amer. Car & Fdy.
	500	S. S. Box	80,000	40	6	Steel Frame	48,400	January	1937	Pullman-Standard
	800	S. S. Auto	80,000	50	6	Steel Frame	54,400	January	Oct.-Nov.	General American
	500	Hopper	100,000	33	0	St. Underframe	45,400	January	1937	Pressed Steel
	500	Hopper	100,000	33	0	St. Underframe	45,600	January	1937	Ryan
	300	Refrigerator	80,000	40	6	Steel Frame	59,700	January	Oct.-Nov.	General American
	1000¶	Hopper	100,000	33	0	Steel	.....	October	January	General American
Illinois Midland	100	Gondola	140,000	46	6	Steel	55,800	January	August	Pullman-Standard
	100	Hopper	100,000	34	9	Steel	45,500	January	July	Pullman-Standard
Illinois Terminal	100	S. S. Box	100,000	40	6	Steel	41,700	Dec., '36	April	Amer. Car & Fdy.
	100	Gondola	100,000	48	6	Steel	51,800	Nov., '36	October	Mount Vernon
	50	Flat	100,000	52	0	Steel	40,000	Nov., '36	November	Mount Vernon
Kennecott Copper Corp.....	15	Air-dump	60,000	31	0	Steel	67,000	August	December	Austin-Western
Lake Superior & Ishpeming.....	300	Hopper-Ore	100,000	19	7½	Steel	37,500	January	June	Bethlehem
Lehigh & New England.....	75	Bulk-Cement	140,000	26	3⅝	Steel	54,100	March	Sept.	Amer. Car & Fdy.
	5	Caboose	.....	24	4⅜	Steel	42,640	February	June	Reading Company
Lehigh Valley	20	Caboose	.....	..	..	.....	.....	February	1937	Company Shops
Lennig & Co., Charles.....	2	Tank	7,000g	31	10¾	Steel	42,000	March	April	Amer. Car & Fdy.
	1	Tank	4,200g	29	6¾	Steel	40,228	March	June	Amer. Car & Fdy.
Lone Star Gasoline Co.	2	Tank	10,000g	38	1	Steel Frame	64,880	August	November	Amer. Car & Fdy.
Louisiana & Arkansas.....	150	Box	100,000	40	6	Steel Frame	42,000	January	May	Pullman-Standard
	50	Hopper	140,000	33	0	Steel	45,800	February	June	Pressed Steel
	275	Flat	140,000	..	..	.....	.....	November	.....	Amer. Car & Fdy.
Louisville & Nashville.....	500	Hopper	100,000	33	0	Steel	41,000	February	November	Bethlehem
	400	Hopper	100,000	33	0	Steel	41,000	February	October	Pressed Steel
	400	Hopper	100,000	33	0	Steel	41,000	February	November	Mount Vernon
	900	Hopper	100,000	33	0	Steel	41,000	February	August	Pullman-Standard
	500	Hopper	100,000	33	0	Steel	41,000	February	September	Amer. Car & Fdy.
	327	Ballast	100,000	30	6	Steel	46,800	February	August	Amer. Car & Fdy.
Magnetic Pigment Co.	1	Tank	8,000g	36	3¾	Steel	52,700	August	December	Amer. Car & Fdy.
Mathieson Alkali Works, Inc.	3	Refrigerator	70,000	40	6	Steel	66,600	February	May	Amer. Car & Fdy.
	2	Box	.....	..	..	.....	.....	Dec., '36	1937	Amer. Car & Fdy.
	1	Box	80,000	39	5½	Steel	66,000	February	May	Amer. Car & Fdy.
McCahan Sug. Ref. & Mol.	5	Tank	7,000g	36	3¾	Steel	42,000	June	July	Amer. Car & Fdy.
Merchants Despatch, Inc.	67	Refrigerator	80,000	33	2	Steel Frame	61,400	January	Jan.-June	M. D. T. Corp.
	450	Refrigerator	80,000	33	2	Steel Frame	59,200	June	July-Sept.	Company Shops
	10	Refrigerator	80,000	33	2	Steel Frame	61,600	February	March	M. D. T. Corp.
	20	Refrigerator	80,000	25	0	Steel Frame	71,000	February	Mar.-July	M. D. T. Corp.
	1	Refrigerator	80,000	33	2	Steel Frame	61,400	June	June	M. D. T. Corp.
	2	Refrigerator	80,000	33	2	Steel Frame	61,200	February	February	M. D. T. Corp.

Purchaser	No.	Class	Capacity	Length, ft.	Length, in.	Construction	Weight	Date of order	Date of delivery	Builder
Merrimac Chemical Co.	4	Tank	7,000g	33	2½	Steel	41,900	August	October	Amer. Car & Fdy.
	3	Tank	8,000g	36	3¾	Steel	42,000	October	December	Amer. Car & Fdy.
	2	Tank	7,000g	..	..	.....	.....	March	July	General American
	2	Tank	6,500g	..	..	.....	.....	October	Jan., '38	General American
Mesta Machine Co.	2	Gondola	200,000	34	1	Steel	53,900	September	November	Pullman-Standard
Michigan Limestone & Chemical Co.	15	Air-Dump	100,000	32	0	Steel Frame	75,000	February	September	Austin-Western
	15	Air-Dump	100,000	30	8½	Steel Frame	64,000	February	October	Differential
Midland Elec. Coal Corp.	5	Hopper	110,000	37	3½	Steel	52,500	August	December	Pressed Steel
Minneapolis & St. Louis	10	Auto	80,000	40	6	Steel Frame	49,900	Nov., '36	March	General American
	2*	Snow Plows	80,000	41	3½	Steel	83,000	June	November	Russell Snow Plow
Minneapolis, St. P. & S. Ste. Marie	100	D. S. Box	100,000	40	6	Steel	45,800	August	November	Pullman-Standard
	100	Ballast	100,000	33	1⅞	Steel	47,400	April	October	Rodger-A. C. & F.
Missouri-Kansas-Texas	500	Gondola	80,000	41	3	Steel	42,000	January	September	Company Shops
	500	Stock	80,000	40	6	Steel Frame	43,600	January	December	Company Shops
	100	Auto	80,000	40	6	Steel	52,000	January	October	Amer. Car & Fdy.
	25	Auto	100,000	50	6	Steel	60,900	January	November	Amer. Car & Fdy.
	100	Auto	100,000	50	6	Steel	59,400	January	September	Amer. Car & Fdy.
	25	Auto	100,000	50	6	Steel	62,900	January	November	Amer. Car & Fdy.
	50	G. S. Hopper	140,000	40	5	Steel	59,000	January	July	Amer. Car & Fdy.
	20	Caboose	.....	36	0	Steel Frame	35,000	January	March	Company Shops
Missouri Pacific	25	Caboose	.....	24	0½	Steel	41,800	January	November	Magor
	500	Hopper	110,000	33	0	Steel	41,300	January	August	Amer. Car & Fdy.
	700	Gondola	100,000	45	0	Steel	45,800	January	December	Pressed Steel
	1000	Box	100,000	40	6	Steel	45,100	January	October	Mount Vernon
	200	Flat	80,000	41	3	Steel	.....	1937	1937	Company Shops
	100	Rack	100,000	40	11	Steel	.....	1937	1937	Company Shops
	50	Rack	80,000	35	6	Steel	.....	1937	1937	Company Shops
Monsanto Chemical Co.	1	Tank	4,159g	..	..	Steel	43,700	March	April	Amer. Car & Fdy.
	1	Tank	4,182g	..	..	Steel	48,860	March	April	General American
	2	Tank	7,052g	..	..	Steel	44,900	March	April	General American
	1	Tank	8,000g	..	..	Steel	52,600	May	June	General American
	8	Tank	7,200g	..	..	Steel	52,000	February	March	Amer. Car & Fdy.
	2	Tank	7,200g	..	..	Steel	52,000	July	August	Amer. Car & Fdy.
Morrell & Company, John	100	Beef Refrig.	80,000	40	0	Steel Frame	64,400	Dec., '36	August	General American
Nashville, Chattanooga & St. Louis	500	S. S. Box	80,000	40	6	Steel	43,300	February	.....	Pullman-Standard
National Tube Co.	20	Gondola Bod.	140,000	48	0	Steel	62,700	May	August	Ralston
	83	Gondola Bod.	140,000	36	0	Steel	53,900	May	August	Ralston
New England Alcohol	1	Tank	8,000g	36	3¾	Steel	40,800	February	April	Amer. Car & Fdy.
	1	Tank	8,000g	36	3¾	Steel	42,140	August	October	Amer. Car & Fdy.
	1	Tank	6,000g	33	1	Steel	44,300	September	November	Amer. Car & Fdy.
	2	Tank	8,000g	36	3¾	Steel	42,140	October	November	Amer. Car & Fdy.
	1	Tank	8,000g	31	6	Steel	42,000	October	December	Amer. Car & Fdy.
New York, Chicago & St. Louis	500	S. S. Box	100,000	40	6	Steel	45,100	January	September	General American
	500	F. B. Gondola	100,000	48	6	Steel	49,700	Dec., '36	May	Amer. Car & Fdy.
	25	D. B. Hopper	140,000	29	3	Steel	52,100	Dec. '36	July	Amer. Car & Fdy.
	75	S. C. Hopper	100,000	33	0	Steel	40,700	Dec., '36	April	Pullman-Standard
	75	S.S.Auto Box	100,000	50	6	Steel	57,500	Dec., '36	July	Ralston
	25	S.S.Auto Box	100,000	50	6	Steel	59,100	Dec., '36	July	Ralston
New York, Ontario & Western	1	Caboose	.....	..	..	.....	.....	1937	1937	Company Shops
Niacet Chemical Corp.	6	Tank	8,000g	37	3¾	Aluminum	35,500	March	October	Amer. Car & Fdy.
	1	Tank	.....	..	..	.....	.....	January	1937	General American
Niagara Smelting Corp.	1	Tank	60,000	33	10	Steel	65,100	October	Jan., '38	Amer. Car & Fdy.
	1	Tank	60,000	..	..	.....	.....	October	December	General American
	2	Tank	32,000	..	..	.....	.....	November	Feb., '38	General American
Norfolk & Western	1000	Hopper	110,000	31	0	Steel	38,800	February	June-Sept.	Virginia Bridge
	1000	Hopper	110,000	31	0	Steel	38,800	February	June-Nov.	Bethlehem
	10	Cement	140,000	31	0	Steel	50,000	May	September	Company Shops
North American Car Corp.	25	Tank	8,000g	37	3¾	Steel	53,000	January	May	Amer. Car & Fdy.
	30	Tank	6,000g	33	4	Steel	47,600	January	May	Amer. Car & Fdy.
	5	Tank	4,500g	31	7	Steel	36,300	January	April	Amer. Car & Fdy.
	5	Tank	6,000g	31	10¾	Steel	37,100	January	April	Amer. Car & Fdy.
	6	Tank	6,000g	33	1	Steel	41,800	January	April	Amer. Car & Fdy.
Northern Pacific	520	D. S. Box	100,000	40	9	St. Underframe	48,400	March	July-Sept.	Pac. Car & Fdy.
	750	Gondola	100,000	41	6	Steel	48,300	March	Aug.-Oct.	Pressed Steel
	250	Gondola	140,000	42	0	Steel	53,600	March	Oct.-Nov.	Amer. Car & Fdy.
	500	Flat	100,000	52	0	St. Underframe	48,200	March	Aug.-Sept.	Bethlehem
Northern Refrigerator Line, Inc.	300	Refrigerator	80,000	33	3	Steel	58,700	January	Sept.-Oct.	Merch. Despatch
Northwestern Refrigerator Line	250	Refrigerator	80,000	32	9⅜	St. Underframe	57,000	November	Feb., '38	Amer. Car & Fdy.
Otis Steel Co.	3	Air Dump	30 cu. yds.	32	6	Steel	67,700	March	June	Pressed Steel
Owens-Illinois Glass Co.	50¶	Cov. Hopper	.....	..	..	.....	.....	June	1937	General American
Pennsylvania	1000	S. S. Box	100,000	50	6	Steel	49,100	April	October	Company Shops
	300	Cov. Hopper	140,000	31	0	Steel	50,000	April	Mar., '38	Company Shops
	1500	Gondola	140,000	52	0	Steel	57,000	April	Feb., '38	Company Shops
Pennsylvania Salt Mfg. Co.	6	Tank	60,000	33	10	Steel	64,700	March	July	Amer. Car & Fdy.
	2	Tank	6,000g	32	3	Steel	41,000	June	August	Amer. Car & Fdy.
	9	Tank	7,000g	32	3	Steel	42,000	June	August	Amer. Car & Fdy.
	4	Tank	60,000	33	10	Steel	64,700	July	September	Amer. Car & Fdy.
Peoria & Pekin Union	25	Hopper	100,000	33	0	Steel	45,200	July	November	Pressed Steel
	25	Gondola	100,000	40	0	Steel	47,700	July	December	Pressed Steel
Pere Marquette	25	Caboose	.....	24	0½	Steel	42,200	January	October	Magor
Phelps Dodge Corporation	30	Dump	30 cu. yds.	..	..	.....	.....	1936	1937	Differential
Philadelphia Quartz Company	8	Tank	100,000	31	6	Steel	43,600	August	October	Amer. Car & Fdy.
Pittsburgh & West Virginia	100	Gondola	140,000	65	6	Steel	60,500	Dec., '36	April	Pullman-Standard
Pittsburgh Plate Glass Co.	16	Tank	30,000	42	4⅛	Steel	53,400	March	July	Amer. Car & Fdy.
	9	Tank	60,000	..	..	.....	.....	August	Dec.-Jan., '38	General American
	6	Tank	32,000	..	..	.....	.....	August	Dec.-Jan., '38	General American
	3	Tank	30,000	..	..	.....	.....	August	Jan., '38	General American
Public Service Co. of Indiana	3	Air Dump	.....	32	6	Steel	66,000	March	June	Pressed Steel
Reading Company	300	D. S. Box	100,000	40	6	Steel	49,400	April	December	Company Shops
	100	D. S. Auto	100,000	40	6	Steel	51,500	April	Jan., '38	Company Shops
	150	D. S. Auto	100,000	50	6	Steel	60,000	April	Feb., '38	Company Shops
	50	D. S. Auto	100,000	50	6	Steel	61,500	April	Mar., '38	Company Shops
	50	Flat	100,000	50	6	Steel	55,900	April	December	Company Shops
Robeson Process Co.	5	Tank	5,000g	36	3¾	Steel	43,200	March	April	Amer. Car & Fdy.
Rohm & Hass Co.	1	Tank	6,000g	32	6¼	Steel	45,828	March	June	Amer. Car & Fdy.
St. Louis-San Francisco	5	S. S. Box	100,000	40	6	Steel Frame	44,500	1937	April	Company Shops
	8	S. S. Box	100,000	40	6	Steel Frame	45,300	1937	.....	Company Shops
	31	Caboose	80,000	29	0	Steel Frame	45,000	1937	Jan.-Oct.	Company Shops
	250	Hopper	100,000	30	6	Steel Frame	38,500	1937	Apr.-July	Company Shops
Seaboard Air Line	200	D. S. Box	100,000	50	0	Steel	52,700	May	December	Pullman-Standard
	25	D. S. Box	100,000	40	6	Steel	56,500	Dec., '36	June-July	Company Shops
Semet-Solvay Company	1	Tank	8,000g	..	..	.....	.....	March	June	General American
	1	Tank	6,000g	..	..	.....	.....	March	July	General American
	5	Tank	6,000g	..	..	.....	.....	June	October	General American
	5	Tank	8,000g	..	..	.....	.....	June	October	General American
	5	Tank	10,000g	..	..	.....	.....	June	September	General American
Shawinigan Products Co.	2	Tank	8,000g	..	..	.....	.....	March	January	General American
Shell Chemical Co.	4	Tank	6,000g	32	3	Steel	38,200	March	May	Amer. Car & Fdy.
	4	Tank	10,000g	..	..	.....	.....	March	July	General American
	1	Tank	50,000	..	..	.....	.....	February	May	General American
Shippers' Car Line	5	Tank	10,000g	32	6¾	Steel	45,900	January	January	Amer. Car & Fdy.
	4	Tank	10,000g	32	6¾	Steel	51,400	January	January	Amer. Car & Fdy.

Purchaser	No.	Class	Capacity	Length, ft.	in.	Construction	Weight	Date of order	Date of delivery	Builder
Solvay Process Co.	7	Tank	60,000	33	10	Steel	64,160	March	August	Amer. Car & Fdy.
	2	Tank	30,000	32	7	Steel	48,640	March	June	Amer. Car & Fdy.
	2	Tank	80,000	42	4⅛	Steel	53,400	March	July	Amer. Car & Fdy.
	1	Tank	6,000g	..	..	.....	.....	March	August	General American
	10	Tank	60,000	..	..	.....	.....	October	Jan.-Feb., '38	General American
Southern Acid & Sulphur	2	Tank	8,000g	36	3¾	Steel	44,350	November	Jan., '38	Amer. Car & Fdy.
Southern Agricultural Tank Line	100¶	Tank	100,000	..	..	Steel	43,200	October	Feb., '38	General American
Southern Alkali Corp.	9	Tank	60,000	33	10	Steel	65,100	August	December	Amer. Car & Fdy.
Southern Pacific	100	Hart Ballast	100,000	30	2¾	Steel	42,900	Dec., '36	April	Rodger Ballast
	100	Gondola	140,000	40	1	St. Underframe	**54,000**	Dec., '36	June	Amer. Car & Fdy.
	200	Flat	100,000	52	0	St. Underframe	42,500	January	September	Company Shops
	100	Gondola	100,000	50	0⅜	St. Underframe	52,000	January	June	Company Shops
	50	Caboose	80,000	29	3¾	Steel	46,500	January	August	Company Shops
Spencer Kellogg & Sons	6	Tank	6,000g	..	..	Steel Frame	43,700	January	February	Amer. Car & Fdy.
	4	Tank	8,000g	..	..	Steel Frame	42,750	January	February	Amer. Car & Fdy.
Stauffer Chemical Co.	2	Tank	100,000	..	..	Steel	.....	February	April	General American
	5	Tank	7,000g	31	10¾	Steel	42,300	February	April	Amer. Car & Fdy.
	1	Tank	3,500g	28	7¾	Steel	34,500	February	May	Amer. Car & Fdy.
	1	Tank	10,000g	..	..	.....	.....	February	April	General American
	5	Tank	7,000g	..	..	.....	.....	March	May	General American
Taylor Chemical Corp.	3	Tank	8,000g	36	3¾	Steel	43,500	October	November	Amer. Car & Fdy.
Tennessee Coal, Iron & R. R. Co.	19	Hopper	140,000	21	11⅞	Steel	41,000	Dec., '36	1937	Pullman-Standard
	21	Gondola	140,000	38	6⅜	Steel	47,000	Dec., '36	1937	Pullman-Standard
Tennessee Eastman Corp.	2	Tank	8,000g	37	3¾	Aluminum	35,500	March	October	Amer. Car & Fdy.
Tennessee Products Corp.	3	Tank	8,000g	..	..	.....	.....	May	October	General American
Texas & New Orleans	99	Gondola	140,000	40	1	St. Underframe	54,700	Dec., '36	June	Amer. Car & Fdy.
	1	Gondola	140,000	40	5	St. Underframe	48,100	Dec., '36	June	Amer. Car & Fdy.
Texas & Pacific	500	Box	100,000	40	6	Steel	46,300	August	Nov.-Dec.	Pullman-Standard
	100	Hopper	100,000	33	0	Steel	41,000	August	December	Bethlehem
Texas Chemical	5	Tank	.....	..	..	Steel	.....	April	1937	General American
Thunder Bay Quaries	3	Air Dump	25 cu. yds.	25	2½	Steel	72,100	March	July	Pressed Steel
Union Carbide	4	Cov. Hopper	100,000	22	8	Steel	42,400	January	June	Greenville
Union Oil Co. of California	1	Tank	10,045g	35	5½	Steel Frame	40,000	January	April	General American
	1	Tank	8,000g	33	5	Steel Frame	.....	September	December	General American
Union Pacific	1000	Ballast	100,000	33	5	Steel Frame	45,600	May	Sept.-Nov.	Amer. Car & Fdy.
	200	Tank	100,000	..	..	Steel Frame	53,300	May	Nov.-Dec.	General American
	50	D. S. Box	100,000	40	6	Steel Frame	35,600	November	Feb., '38	Bethlehem
	1900	D. S. Box	100,000	40	6	Steel Frame	39,000	May	.....	Company Shops
	50	D. S. Box	100,000	40	6	Steel Frame	37,300	November	.....	Company Shops
	400	D. S. Auto	100,000	50	8	Steel Frame	50,900	May	.....	Company Shops
	200	D. S. Auto	100,000	50	8	Steel Frame	48,700	May	.....	Company Shops
	100	D. S. Auto	100,000	50	6	Steel Frame	51,700	May	.....	Company Shops
Union Tank Car Co.	11	Tank	4,600g	33	10	Steel	45,000	May	August	Amer. Car & Fdy.
United Carbon Co., Inc.	10	Hopper	80,000	45	10½	Steel	50,000	July	November	Amer. Car & Fdy.
U. S. Navy Department	2	Box	100,000	40	6	Steel Frame	.....	1937	.....	Haffner-Thrall
	1	Flat	100,000	..	..	.....	.....	1937	.....	Haffner-Thrall
	2	Flat	140,000	..	..	Steel	.....	1937	.....	Haffner-Thrall
United States Rubber Prod.	9	Tank	10,000g	..	..	.....	.....	August	Jan., '38	General American
U. S. Sugar Corporation	60	Cane	60,000	36	0	Steel Frame	35,000	June	November	Magor
Utah Copper Co.	2	D. S. Caboose	60,000	19	0	Steel Frame	37,700	August	December	Pac. Car & Fdy.
Vel-A-Gas Co.	1	Tank	10,000g	..	..	.....	.....	September	December	General American
Virginia Smelting Co.	1	Tank	40,000	31	10	Steel Frame	52,240	January	April	General American
Warrior River Terminal	20	S. S. Box	169,000	40	6	Steel	44,200	April	December	Pullman-Standard
Wabash	425¶	Hopper	110,000	33	0	Steel	40,900	1936	April	Wabash Car & Eq.
Western Maryland	20	Cov. Hopper	121,000	25	9	Steel Frame	48,000	November	November	Company Shops
Western Pacific	50	Flat	100,000	50	0	Steel Frame	43,000	February	April	Pac. Car & Fdy.
Wheeling & Lake Erie	250	Hopper	140,000	35	0¼	Steel	40,700	January	December	Company Shops
	12	Cov. Hopper	140,000	26	3¾	Steel	53,875	June	Aug.-Sept.	Amer. Car & Fdy.
Wheeling Steel Corp.	12	Air Dump	50 cu. yds.	42	2½	Steel	86,200	February	July	Pressed Steel
Wisconsin Ctrl (M.Ste.P.&S.S.M.)	100	Gondola	100,000	41	6	Steel	**48,500**	March	September	Pullman-Standard
	250	D. S. Box	100,000	50	0	Steel	50,400	March	August	Pullman-Standard
	100	Hopper	100,000	33	0	Steel	40,800	March	October	Pullman-Standard

Export

Purchaser	No.	Class	Capacity	Length, ft.	in.	Construction	Weight	Date of order	Date of delivery	Builder
Argentine State Ry.	70	Tank	.....	..	..	Steel	.....	Nov., '36	January	Amer. Car & Fdy.
Cerro De Pasco	10	Ore	80,000	20	6	Steel	.....	July	November	Bethlehem
	4	Well	.....	..	..	Steel	.....	March	July	Amer. Car & Fdy.
Chile Exploration Co.	4	Flat	.....	..	..	Steel	.....	February	June	Amer. Car & Fdy.
International Petroleum Co.	1	Tank	.....	..	..	Steel	.....	March	June	Amer. Car & Fdy.
	1	Tank	.....	..	..	Steel	.....	September	November	Amer. Car & Fdy.
	6	Tank	.....	..	..	Steel	.....	November	.....	Amer. Car & Fdy.
Mexican Railway	6*	Stock	27,200	42	0	Wood	18,400	February	August	Company Shops
National Railways of Mexico	175	S. S. Box	100,000	40	6	.....	44,400	April	Nov.-Dec.	General American
	150	Box	100,000	40	6	Steel	44,200	March	September	Pullman-Standard
	250	Box	60,000	32	0	Steel	33,800	March	September	Pullman-Standard
	175	Box	.....	..	..	Steel	.....	April	November	Amer. Car & Fdy.
Newfoundland Railway	9	Air-Dump	16 cu. yds.	23	10	Steel	39,000	May	December	Magor
	1*	Caboose	.....	..	..	.....	.....	1937	1937	Company Shops
Pierce Oil Co.	6	Tank	.....	..	..	Steel	.....	March	June	Amer. Car & Fdy.
Sorocabana	500	Box	72,000	40	6	Steel	27,900	July	Nov.-Jan., '38	Pullman-Standard
Standard Oil Company of N. J.	4	Tank	8,000g	..	..	Steel	.....	April	June	Amer. Car & Fdy.
	2	Tank	12,000g	..	..	.....	.....	January	April	General American
Venezuela Sugar Corp.	2	S. S. Box	30,000	24	3½	Steel Frame	17,500	February	June	Magor

Canada

Purchaser	No.	Class	Capacity	Length, ft.	in.	Construction	Weight	Date of order	Date of delivery	Builder
Canadian Johns-Manville Co.	9	Air-Dump	100,000	31	9¼	Steel	.....	May	.....	National Steel
Canadian National	1000	S. S. Box	80,000	40	6	Steel	45,000	February	May-June	Can. Car & Fdy.
	1000	S. S. Box	80,000	40	6	Steel	45,500	February	Nov.-Jan., '38	National Steel
	30	Sand	140,000	31	2½	Steel	53,500	June	October	National Steel
	1000	S. S. Box	80,000	40	6	Steel	45,000	February	Sept.-Dec.	Eastern Car Co.
	300	Gondola	140,000	48	6¼	Steel	52,400	February	May-June	Eastern Car Co.
	175	Refrigerator	80,000	35	2¼	St. Underframe	57,000	February	July-August	Eastern Car Co.
	125	Refrigerator	.....	..	..	.....	.....	1937	1937	Company Shops
	58	Flat	.....	..	..	.....	.....	February	.....	Can. Car & Fdy.
Canadian Pacific	1700	D. S. Box	80,000	40	6	Steel	44,400	February	October	Can. Car & Fdy.
	1100	D. S. Box	80,000	40	6	Steel	45,100	February	October	National Steel
	200	D. S. Auto	80,000	40	6	Steel	46,200	February	October	Can. Car & Fdy.
	200	D. B. Coal	100,000	37	6	Composite	49,200	February	June	National Steel
	100	L. S. Coal	150,000	48	6¼	Steel	50,100	February	July	National Steel
	300	Twin Hopper	100,000	33	0	Steel	42,300	February	May	National Steel
Dominion Steel & Coal Corp.	100	Hopper	.....	..	..	.....	.....	January	.....	Eastern Car Co.

¶ Leased.
* Not included in totals.

Passenger-Train Cars Ordered in 1937

Domestic volume of 829 cars exceeds totals for each year since 1929 and exceeds 1936 figure by 170 per cent

By Frank W. Kraeger
Associate Editor

REPRESENTING the highest volume in passenger-train car orders since 1929, the number of such cars ordered in the United States during 1937 for domestic service reached 829, or 170 per cent in excess of the 1936 total of 307 cars. In fact, it will be seen, upon reference to table No. 2, that the 1937 total falls only 13 cars short of equaling the *combined* year totals for the years 1931 to 1936, inclusive.

The year total comprises all revenue passenger-train cars, including members of articulated units, except those containing power plants, which are listed and totaled separately as rail-motor cars. Of the latter, six were ordered during the year for domestic service, as compared with seven rail-motor cars ordered in 1936. So-called "cars" placed at the head of streamlined trains and devoted entirely to housing of power plant facilities and classed as non-revenue, are listed with locomotives elsewhere in these pages.

Table I—Passenger-Train Car Orders in 1937

For service in the United States	829
For service in Canada	99
For export to other countries	..
Grand total	928

Table II—Orders for Passenger-Train Cars Since 1901

Domestic Orders Only

Year	Passenger cars	Year	Passenger cars
1901	2,879	1909	4,514
1902	3,459	1910	3,881
1903	2,310	1911	2,623
1904	2,213	1912	3,642
1905	3,289	1913	3,124
1906	3,402	1914	1,674
1907	1,791	1915	1,978
1908	1,319		

Domestic and Foreign

Year	Domestic	Canadian	Export	Total
1916	2,302	...	109	2,411
1917	1,124	...	43	1,167
1918	9	22	26	57
1919	292	347	143	782
1920	1,781	275	38	2,094
1921	246	91	155	492
1922	2,382	87	19	2,488
1923	2,214	263	6	2,483
1924	2,554	100	25	2,679
1925	2,191	50	76	2,317
1926	1,868	236	58	2,162
1927	1,612	143	48	1,803
1928	1,930	334	29	2,293
1929	2,303	122	33	2,458
1930	667	203	15	885
1931	11	11	21	43
1932	39	...	...	39
1933	6	...	...	6
1934	388	...	15	403
1935	91*	16	...	107*
1936	307†	10	...	317†
1937	829	99	...	928

* Revised to include 28 body units of articulated or partially-articulated trains.

† Includes 102 body units of articulated or partially-articulated trains.

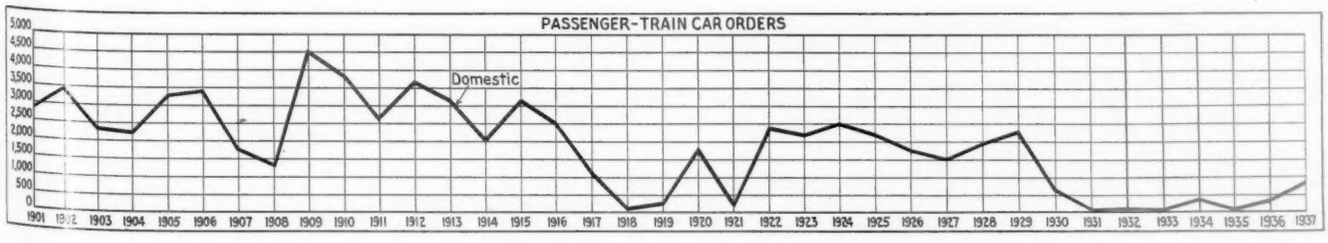
During the early months of 1937, the passenger-train car market showed a spectacular increase in activity, after a lethargy of some six years. By the end of the first quarter of the year the *Railway Age* was able to announce that in the three months elapsed, 386 cars had been ordered, or 79 in excess of the number of cars ordered during the whole of 1936. At the end of the first half it was seen that orders during the period represented an increase of 300 per cent over volume during the corresponding six months of 1936 and that they exceed the 12-months' totals of each of the years 1931 to 1936, inclusive.

Of the total number of 829 cars requisitioned during 1937, only 64 were contracted for in company shops. Thus outside builders received by far the lion's share in the year's passenger car orders.

Air-conditioning programs in 1937 fell slightly below the record reached during 1936. A total of 2,512 passenger cars were fitted with air-conditioning equipment during 1937 as compared with 2,551 cars air-conditioned during 1936. Of this number the Pullman Company conditioned 688 cars. The estimated total of air-conditioned cars in service at the close of 1937 is quoted at 10,930, of which number 4,839 were operated by Pullman.

No passenger-car orders were received from abroad during 1937, constituting the third successive year in which the export market has been entirely inactive. In addition, no rail-motor car export orders were recorded during the year, as compared with orders for six units received in 1936.

A remarkable upturn in volume favored Canadian



Passenger-Train Car Orders from 1901 to 1937

builders, who received orders for a total of 99 passenger-train cars. This represents an almost 900 per cent gain over the total of 10 cars ordered during 1936 and is far in excess of the *combined* total of 37 reached in all the years since 1930.

Passenger-train cars built in the United States for domestic service during 1937, as distinguished from cars ordered, totaled 664, as compared with 142 cars built during 1936. In Canada 70 passenger-train cars were built during the year, as compared with 10 completed during the previous year.

The accompanying lists of orders, amplifying the summary tables also published herewith, have been compiled in the usual way. Returns from railroads were checked against lists of orders supplied by the car builders, largely through the courtesy of the American Railway Car Institute.

Table III—Passenger-Train Cars Built in 1937

	United States	Canada	Total
Domestic	664	70	734
Foreign	...	...	...
	664	70	734

Comparison with Previous Years

Year	Domestic	Foreign	Total
1899	1,201	104	1,305
1900	1,515	121	1,636
1901	1,949	106	2,055
1902	From 1902 to 1907		1,948
1903	passenger car figures		2,007
1904	in these two columns		2,144
1905*	included in corre-		2,551
1906*	sponding freight car		3,167
1907*	columns.		5,457
1908*	1,645	71	1,716
1909*	2,698	151	2,849
1910*	4,136	276	4,412
1911*	3,938	308	4,246
1912†	2,822	238	3,060

* Includes Canadian output.
† Includes Canadian output and equipment built in company shops.

	United States			Canadian			Grand
Year	Domestic	Foreign	Total	Domestic	Foreign	Total	total
1913	2,559	220	2,779	517	...	517	3,296
1914	3,310	56	3,366	325	...	325	3,691
1915	1,852	14	1,866	83	...	83	1,949
1916	1,732	70	1,802	37	...	37	1,839
1917	1,924	31	1,955	45	...	45	2,000
1918	1,480	92	1,572	1	...	1	1,573
1919	306	85	391	160	...	160	551
1920	1,272	168	1,440	...	...	...	1,440
1921	1,275	39	1,314	361	...	361	1,675
1922	676	144	820	71	...	71	891
1923	1,507	29	1,536	...	...	...	1,536
1924	2,150	63	2,213	167	...	167	2,380
1925	2,363	50	2,413	...	...	...	2,411
1926	2,184	102	2,286	285	...	285	2,571
1927	1,785	50	1,835	126	...	126	1,963
1928	1,356	15	1,371	237	...	237	1,608
1929	1,254	20	1,274	162	...	162	1,436
1930	1,264	40	1,304	210	...	210	1,514
1931	198	21	219	66	...	66	285
1932	39	...	39	...	...	...	39
1933	6	...	6	...	...	...	6
1934	268	15	283	...	...	...	283
1935	197	...	197	...	...	...	197
1936	142	...	142	10	...	10	152
1937	664	...	664	70	...	70	734

Passenger-Train Car Orders in 1937

For Service in the United States

Purchaser	No.		Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Atchison, Topeka & Santa Fe	6	AC	Club Bag.	79	10	33	.....	February	October	Budd
	30	AC	Coach	79	10	62	.....	February	July-Sept.	Budd
	6	AC	Lounge	79	10	27	.....	February	Sept.-Oct.	Budd
	10	AC	Diner	83	2	36	.....	February	May-June	Budd
	2	AC	Chair-Obs.	80	0	56	96,000	August	Jan., '38	Budd
	2		Bag.-M.-Exp.	73	10	..	81,200	August	Mar., '38	Budd
Atlantic Coast Line	15	AC	Coach	83	6¼	68	128,000	April	Jan.-Feb., '38	Bethlehem
	15		Express	74	9¾	..	133,000	April	Jan.-Feb., '38	Bethlehem
Bangor & Aroostock	1		Buffet-Coach	84	6¼	58	117.800	Dec., '36	July	Pullman-Standard
	1		Buffet-Coach	84	6¼	58	117,300	Dec., '36	August	Pullman-Standard
	1		Buffet-Coach	84	6¼	58	117,600	Dec., '36	August	Pullman-Standard
	1		Coach	84	6¼	84	111,300	Dec., '36	July	Pullman-Standard
	1		Coach	84	6¼	84	111,400	Dec., '36	July	Pullman-Standard
	1		Bag. & Mail	74	5⅛	..	96,700	Dec., '36	October	Pullman-Standard
	1		Bag. & Mail	74	5⅛	..	96.500	Dec., '36	October	Pullman-Standard
	1		Bag. & Mail	74	5⅛	..	96,500	Dec., '36	October	Pullman-Standard
Boston & Maine	20		Coach	84	6¼	84	108,800	January	October	Pullman-Standard
Burlington Refrigerator Express Co.	30		Pass.-Refrig.	42	6	..	97,200	January	August	Company Shops
Central of Georgia	3		Express	74	3⅛	..	100,400	January	October	Bethlehem
	5	AC	Coach	84	2¾	66	120,000	January	December	Bethlehem
Chesapeake & Ohio	3		Pass. & Bag.	67	8	44	77,100	Dec., '36	September	Bethlehem
	10		Horse-Exp.	70	8½	..	142,600	January	November	St. Louis Car
Chicago & North Western	16		Chair	81	0	48	112,900	Dec., '36	September	Pullman-Standard
	7		Women's Ch.	81	0	56	114,400	Dec., '36	September	Pullman-Standard
Chicago, Burlington & Quincy	3	AC	Dining	83	2	36	115,000	1937	1938	Budd
	3	AC	Chair	79	10	52	90,000	1937	1938	Budd
	2	AC	Dinette	87	6	64	65,000	1937	1938	Budd
	1	AC	Coach-Din.	64	0	40	60,000	1937	1937	Budd
	6		.....	..	..	..	.....	1937	1937	Company Shops
Chicago, Milwaukee, St. Paul & Pacific	19	AC	Coach	80	8¾	66	100,000	March	July	Company Shops
	1	AC	Coach-Bunk	80	8¾	72	102,100	March	August	Company Shops
	7	AC	Diner	80	11	48	109.600	March	August	Company Shops
	4	AC	Pass. & Bag.	80	8¾	28	98,000	March	August	Company Shops
	1	AC	Pass. & Bag.	80	8¾	44	99,900	March	August	Company Shops
	1		Mail & Exp.	72	10	..	92,600	March	July	Company Shops
Chicago, Rock Island & Pacific	10	AC	Coach	78	6½	56	112,000	May	Jan., '38	Pullman-Standard
Colorado & Southern	2		Chair	79	8	62	97,800	October	.....	Budd
Erie	80		Milk	40	8¾	..	59,400	April	May-July	Greenville
Fort Worth & Denver City	4	AC	Coach	79	10	52	96.890	February	November	Budd
Great Northern	12	AC	Coach	84	1½	58	134,170	January	Oct.-Nov.	Pullman-Standard
Illinois Central	20		Bag. & Exp.	52	6	..	72,200	January	November	Amer. Car & Fdy.
Missouri-Kansas-Texas	1	AC	Lounge	78	10	42	167,000	January	October	Amer. Car & Fdy.
	3	AC	Diner	78	10	36	181,700	January	November	Amer. Car & Fdy.
	25	AC	Chair	79	10	52	160,000	January	Nov.-Jan., '38	Amer. Car & Fdy.
New York Central	6	AC	Dining	82	4	38	144,000	July	.....	Pullman-Standard
	4		Mail & Bag.	82	4	..	129,000	July	.....	Pullman-Standard
	2	AC	Coach	77	0	52	90,000	November	.....	Budd
New York, New Haven & Hartford	50	AC	Coach	82	4½	92	108,000	January	July-Oct.	Pullman-Standard
	5	AC	Grill	82	4½	51	118,000	January	July-Aug.	Pullman-Standard
Norfolk & Western	9		Postal	64	5	..	114,000	March	December	Bethlehem
Northern Refrigerator Line, Inc.	100¶		P.-Exp.-Ref.	53	0	..	101,700	Dec., '36	May-June	Pullman-Standard
Pennsylvania	1	AC	Diner	84	8	42	105,550	July	November	Budd
	1	AC	Diner	84	8	44	105,550	August	November	Budd
Pere Marquette	10		Bag. & Exp.	70	8½	..	134,500	January	September	St. Louis Car Co.
Pullman Company	171		Sleeping	..	..	..	.....	1937	.....	Pullman-Standard
Reading Co.	2	AC	Coach-Obs.	81	½	70	97,130	April	November	Budd
	2	AC	Coach	77	0	68	97,681	April	November	Budd
	1	AC	Diner	80	0	51	110,245	April	November	Budd

In This Southern Pacific "Challenger" Car, Built By Pullman-Standard, the Construction is a Combination of Welded High-Tensile Steel and Stainless Steel Sheets on the Exterior

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
St. Louis-San Francisco	1	Cafe-Lounge	80	0	34	193,800	.....	October	Company Shops
St. Louis Southwestern	10 AC	Coach	82	4¼	76	117,700	January	Nov.-Dec.	Pullman-Standard
Southern Pacific	2	Baggage	79	2	..	92,440	January	August	Pullman-Standard
	17 AC	Coach	79	2	48	105,200	January	August	Pullman-Standard
	18 AC†	Coach	66	1	50	87,500	January	August	Pullman-Standard
	2 AC	Parlor	79	2	32	105,100	January	August	Pullman-Standard
	2 AC	Din.-Lounge	78	1½	..	112,000	January	August	Pullman-Standard
	2 AC	Tavern	79	2	..	119,000	May	December	Pullman-Standard
	2 AC	Coffee Shop	79	2	..	121,000	May	December	Pullman-Standard
Texas & New Orleans	2	Baggage	79	2	..	91,640	Dec., '36	August	Pullman-Standard
	2 AC	Coach	79	2	48	104,200	Dec.. '36	August	Pullman-Standard
	8 AC†	Coach	66	1	50	87,500	Dec., '36	August	Pullman-Standard
	2 AC	Parlor	79	2	32	104,480	Dec., '36	August	Pullman-Standard
	2 AC	Din.-Lounge	79	2	46	111,740	Dec., '36	August	Pullman-Standard

Canada

Purchaser	No.	Class	Length Ft.	Length In.	Seating Capacity	Weight	Date of Order	Date of Delivery	Builder
Canadian National	50 AC	Coach	73	6	64	135,000	March	Oct.-Dec.	Can. Car & Fdy.
	10	Mail & Exp.	73	6	..	.....	April	December	Can. Car & Fdy.
	10	Baggage	73	6	..	.....	April	Jan., '38	National Steel
Canadian Pacific	1 AC	Coach & Smo.	65	0	72	118,000	February	1938	Nat. Stl.-Co. Shops
	2	Coach	77	9½	67	118,000	February	1938	Nat. Stl.-Co. Shops
	1 AC	Buff.-Parlor	78	3½	32	120.000	February	1938	Nat. Stl.-Co. Shops
	3	Mail & Exp.	70	7	..	108,000	February	1938	National Steel
	2	Bag. & Exp.	70	7	..	107,000	February	1938	National Steel

AC—Indicates cars are air conditioned.
¶ Leased.
† Body units of articulated or partially articulated trains.

Rail-Motor Cars

For Service in the United States

Road	No.	Type of Power Plant	Horse-Power	Seating Capacity	Length of Bagg. Compt. Ft.	Length of Bagg. Compt. In.	Weight	Builder
Chicago & Eastern Illinois	2AC	Gasoline	200	61	..	..	70,000	Amer. Car & Fdy.
Minneapolis, St. Paul & Sault Ste. Marie	1	Gasoline	85	5	..	..	4,050	Ford Motor Co.
Missouri & Arkansas	1	Gasoline	92	28	16	3	31,500	J. G. Brill Co.
Washington, Idaho & Montana	1	Gasoline	110	12	14	8	.....	Fairmont
Wisconsin Central	1	Gasoline	85	5	..	..	4,050	Ford Motor Co.

Canada

Road	No.	Type of Power Plant	Horse-Power	Seating Capacity	Length of Bagg. Compt. Ft.	Length of Bagg. Compt. In.	Weight	Builder
White Pass & Yukon	1	Gasoline	85	20	20	..	6,000	Westmnstr. Ir. Wks.

Freight Cars Ordered in 1937

(*Continued from page 81*)

stalled as reported in statistics issued by the Association of American Railroads.

The appended tables contain a detailed statement of orders for new freight cars, or those having new bodies, placed during 1937 by railroads and industrial concerns; also those placed in Canada and for export. The list of orders was compiled from information furnished to the *Railway Age* by the railroads, private car lines, and other purchasers of cars, in response to requests for this information. The data thus furnished were then checked against lists of orders supplied by the car builders, and amplified accordingly, and also against the weekly reports of orders appearing in the Equipment and Supplies column of the *Railway Age*. The production figures were secured in response to requests to the car builders for this information. As in former years, the *Railway Age* is especially indebted to the American Railway Car Institute for its assistance in making available reports of the companies affiliated with that organization.

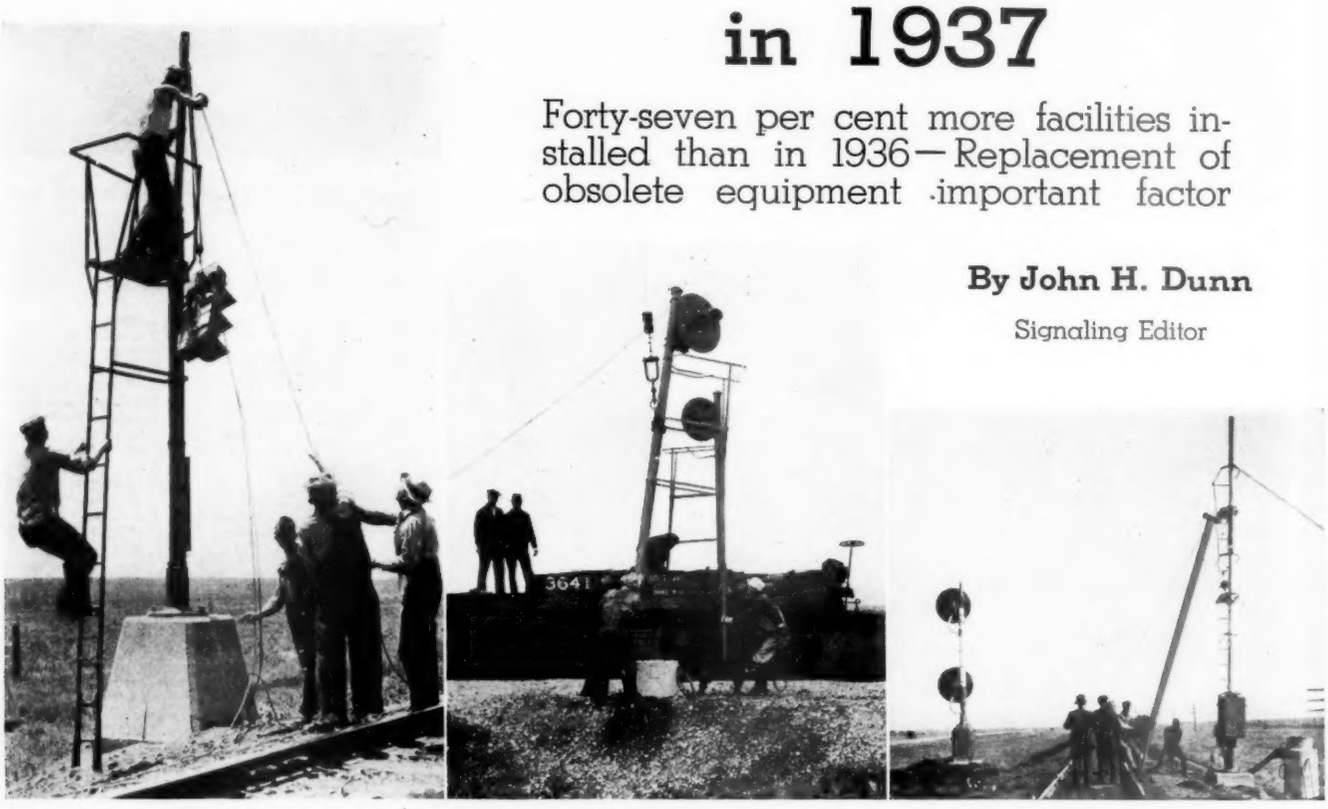
The *Railway Age* is not sufficiently optimistic to believe that the lists can include all the orders placed or that the figures of production are of scientific accuracy. However, it is believed that such omissions as occur will be found to be small and unimportant, and will not vitiate the value of the figures, particularly with respect to comparisons with preceding years, which, after all, is the primary purpose of the compilations.

Signaling Construction Increased in 1937

Forty-seven per cent more facilities installed than in 1936—Replacement of obsolete equipment important factor

By John H. Dunn

Signaling Editor



The Missouri Pacific, the Wabash, and the Burlington Handled Extensive Signaling Construction Programs During 1937

SIGNALING construction in all its phases increased in the United States and Canada during 1937, the increase being especially marked in new automatic block signaling and in the rehabilitation of signaling and interlockings. The number of signaling units placed in service during 1937 totaled 6,599, as compared with 4,489 for the previous year. The total for either of these years is considerably larger than that for any of the years 1932 to 1935, inclusive, but is still far short of the 1929 figure of 16,223 units and the 1930 total of 17,499 units. In brief, the major items of equipment placed in service during 1937 included automatic signals, 2,111 units as compared with 838 in 1936; highway crossing protection, 2,683 units as compared with 2,234 for 1936; interlocking levers, 315 units; signals at remote and centralized control, as well as at automatic interlocking plants, 579 units; spring switches, 406 units; and car retarders, 40 units.

Automatic Block Gains

During 1937, automatic block signaling was placed in service on 1,332.8 miles of road, as compared with 498 miles in 1936, 463 miles in 1935, and 164 miles in 1934. Of this total, 1,194.7 miles represented new signaling installations on lines not previously equipped, last year being the first year since 1931 in which this total has exceeded 1,000 miles, the low being 118 miles in 1933. The Baltimore & Ohio practically completed the signaling of its through main routes by equipping 326 miles of single track and 12 miles of double track, mostly in Ohio and Illinois on the line to St. Louis, Mo. The Missouri Pacific completed the signaling of its Kansas City-Pueblo route by installing signals on 235 miles of single track in Kansas and Colorado. The Rock Island equipped 46.5 miles of single track on its Chicago-Peoria line, where one of the new Rocket trains is operated, and also signaled 126 miles of single track between Herington, Kan., and Pratt, on the route of its Golden State Limited. The Wabash signaled 119 miles of single track and 20 miles of double track, completing the signaling between Chicago and Decatur on the route to St. Louis. The Chicago, St. Paul, Minneapolis & Omaha signaled 50 miles of its single track between St. Paul and Omaha.

Comparison of Annual Signaling Construction

	Number of Units Completed Each Year					
	1932	1933	1934	1935	1936	1937
Automatic block signals	617	1,189	372	749	838	2,111
Highway crossing signals	879	1,010	768	1,252	2,234	2,683
Levers of interlocking	611	782	307	468	554	315
Levers added at rebuilt plants	124	106	433	182	99	63
Levers of remote and centralized control	93	159	141	93	140	259
Power-operated switches in remote and centralized control	63	67	89	50	86	143
Signals controlled in remote and centralized control	139	228	198	124	205	438
Signals in automatic interlockings	251	134	152	124	117	141
Spring switches	57	42	47	79	216	406
Number of retarders	3	3	..	..	..	40
Totals	2,837	3,720	2,507	3,121	4,489	6,599

The replacement of old automatic signaling, although not counted as new mileage, involves the use of new materials that in some instances approximate new installations. The major programs of this character carried

out on nine roads during 1937, as indicated in the table, totaled 119 miles of road, using 273 light signals and numerous other accessories and materials. The Chesapeake & Ohio replaced semaphores with light signals on 33 miles, and the Boston & Albany on 23 miles of three- and four-track line.

In addition to the entries in the table, the Burlington, as a part of a C.T.C. project, replaced semaphores with light signals on 118 miles of line. The New York Central replaced semaphores on 30 miles of road totaling 94 track miles, using 90 color-light signals. The Union Pacific respaced intermediate semaphores and installed three-aspect head-block signals, using 84 new light signals on 180 miles of single-track line and semaphores were replaced with new color-light signals throughout on 26 miles of double track. Certain roads such as the Santa Fe have provided an additional fourth aspect on many automatic block signals, and although these signals are not included in the statistics, the installations include numerous signal units, relays and circuits.

The largest signaling project under way at this time is that on the Pennsylvania between Paoli, Pa., and Harrisburg, in connection with the electrification of some 315 miles of road and 773 miles of track. In addition to an entirely new arrangement of code-control wayside signals and cab signaling, several C.T.C. installations and combinations of interlocking are involved.

Automatic Block Signals Completed During 1937

Road	Location	Miles of Road	Number of Signals	Manufacturer	Power Supply
A. T. & S. F.	Birds, Tex., to Belt Junction	2.5s	7s	Union	Prim.
B. & O.	Stewart, Ohio, to Grosvenor	14.5s	30cp	G.R.S.	ACF
	New Marshfield, Ohio, to Byers Junction	31.4s	73cp	G.R.S.	ACF
	Byers Junction, Ohio, to West Junction	7.5d	11cp	G.R.S.	ACF
	Chillicothe, Ohio, to Midland City	53.0s	125cp	G.R.S.	ACF
	N. Vernon, Ind., to Vincennes	116.3s	227cp	G.R.S.	ACF
	E. St. Louis, Ill., to "HN" Cabin	4.4d	11cp	G.R.S.	ACF
	"HN" Cabin, Ill., to Olney	110.9s	193cp	G.R.S.	ACF
B. & Ar.	M. P. 106 to 109.8 Maine	3.8s	11s	..	ACF
B. & A.	†Palmer, Mass., to Springfield	8.1d	16c	G.R.S.	ACF
	†Springfield, Mass.	4.0t	8c	G.R.S.	ACF
	†Springfield, Mass.	1.2f	5c	G.R.S.	ACF
	†Pittsfield, Mass., to W. Pittsfield	3.0d	5c	G.R.S.	ACF
	†W. Pittsfield, Mass., to State Line	7.1t	18c	G.R.S.	ACF
B. & M.	Wigginville, Mass., to Bleachery	1.0s	..	..	Prim.
	Lincoln Sq., Mass., to Barber	1.7s	2c	..	ACF
	Mystic Jct., Mass., to Somerville Jct.	1.6s	1c	..	ACF*
		..	1c	..	Prim.
	Somerville Jct., Mass., to Winter Hill	0.7s	1c	..	Prim.
	Manchester, N. Y.	0.3s	1s	..	Prim.
	Peabody, Mass.	0.9s	2s	..	Prim.
		0.4d	..	..	..
C. N.	Danforth, Ont., to Toronto	5.7d	10c	G.R.S.	ACF
	Orillia, Ont., to Atherly Jct	2.7s	4s	..	..
	Port Arthur Division	2.3s	3s	Union	Prim.
C. P.	Louiseville, Que., to Trois Rivieres	19.2s	30c	Union	ACF
C. & O.	Balcony Falls, Va., to Greenlee	4.0d	4c	Union	..
	Vauces, Ohio, to Parsons	45.0d	46c	Union	ACF*
	†Garrison, Ky., to Concord	16.0d	16c	Union	ACF
	†Broshears, Ky., to Augusta	17.0d	12c	Union	ACF
C. M. St. P. & P.	Milwaukee, Wis.	4.5d	11c	Union	ACF*
C. N. S. & M.	Evanston, Ill.	0.7d	1c	Union	AC
C. R. I. & P.	Bureau, Ill., to Peoria	46.5s	65c	Union	ACF*
		3.0d	..	..	..
	Herington, Kan., to Pratt	126.6s	173c	Union	ACF*
C. St. P. M. & O.	Merriam, Minn., to Mankato	50.0s	74c	G.R.S.	ACF*
D. L. & W.	†Paterson Jct., N. J., to Mountain View	8.3d	13c	Union	ACF
	†Slateford Jct., Pa., to Pocono Summit	16.8d	49c	Union	ACF
		2.8t	..	..	..
		9.4f	..	..	..
D. & R. G. W.	Salida, Colo.	2.0d	2c	G.R.S.	ACF
	Pueblo, Colo.	1.0d	1c	G.R.S.	ACF
E. J. & E.	Rondout, Ill., to Barrington	14.0s	12c	G.R.S.	ACF*
	Joliet, Ill., to Frankfort	10.0s	4c	G.R.S.	ACF*
Ind. Union	Indianapolis, Ind.	2.5s	2c	Union	ACF
L. V.	Pattenburg, N. J., to West Portal	3.8f	60pl	G.R.S.	AC
L. & N.	Louisville, Ky.	2.0d	3s	G.R.S.	ACP
	E. St. Louis, Ill.	1.0d	2s	..	Prim.
M-K-T	Alvarado, Tex., to Grandview	6.5s	4c	Union	ACP
		..	2c	Union	ACF
M. P.	McCracken, Kan., to Sugar City, Colo.	234.5s	262c	G.R.S.	ACF
	North Junction, Ill., to Gale	1.5s	2c	G.R.S.	ACF
N. Y. N. H. & H.	Sound View, Conn., to Waterford	8.6s	10c	G.R.S.	ACF
N. P.	Whitehall, Mont., to E. Butte	29.4s	36c	G.R.S.	ACF*
	E. Butte, Mont., to Butte	1.8d	5c	G.R.S.	AC
	Warm Springs, Mont., to Garrison	25.5s	26c	G.R.S.	AC
Pa.	Driftwood, Pa., to Huntley	4.4d	1s	Union	ACF
		..	2pl	Union	..
	Huntley, Pa., to Sterling Run	5.1s	4pl	Union	ACF
St. L.-S. F.	Hoxie, Ark., to Bay	32.7s	51s	Union	Prim.
Southern	Beverly, Tenn., to Clinton	22.0s	52c	G.R.S.	AC
		0.5d	..	..	..
S. P. T. & N. O.	Edinburg, Tex., to Edinburg Jct.	2.1s	3s	G.R.S.	ACF
	Houston, Tex.	2.1s	2s	Union	ACF
		..	6c	Union	..
U. P.	†Silver Creek, Neb., to Central City	21.0d	30c	Union	ACF*
	†Julesburg, Colo., to La Salle	..	74c	Union	ACF*
	†Denver, Colo., to Sand Creek	5.0d	17c	Union	ACF*
	†Sand Creek, Colo., to La Salle	..	10c	Union	ACF*
Wabash	Orland Park, Ill., to Lodge	119.0s	145c	Union	ACF*
	Boody, Ill., to Taylorville	20.0d	22c	Union	ACF*
Totals		1,101.4s	1,285c		
		203.1d	670cp		
		13.9t	66pl		
		14.4f	90s		
Grand Totals		1,332.8	2,111		

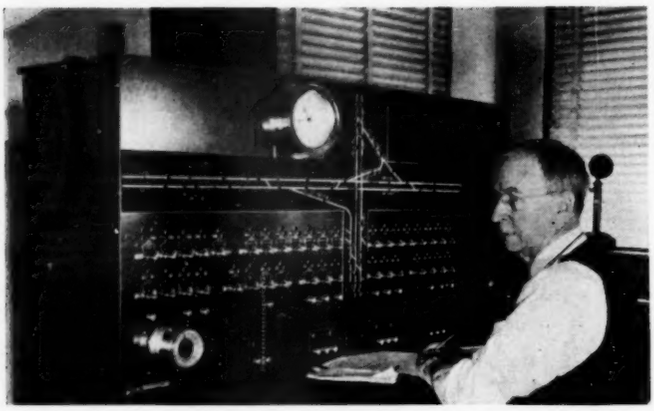
Legend:
In "Miles of Road" column: s = Single track, d = Double track, t = Three tracks, f = Four tracks.
In "Number of Signals" column: s = Semaphore, cp = Color-position, pl = Position-light, c = Color-light.
In "Power Supply" column: AC = Alternating current, ACF = A-C floating, ACF* = A-C floating with primary battery for track circuits, ACP = A-C primary, Prim. = Primary.
†Changed from semaphore to color-light signals.

Interlocking Progress

No new terminals involving large interlockings were completed during 1937, so that, with the exception of several plants installed in subways in New York, Newark, N. J., and Philadelphia, Pa., construction activities in this field were devoted primarily to the installation of modern equipment to replace antiquated plants or to consolidate two or more plants into one control system. One of the larger regular interlockings installed during the year was a 19-lever electric plant on the Erie at Rutherford, N. J., to replace a previous plant. At Delair, N. J., near Philadelphia, Pa., the Pennsylvania installed a C.T.C. type 38-lever machine to combine the control of what were formerly four interlockings. At Merriam, Minn., the Omaha installed a 12-lever desk type machine to control an electric plant, while at Covington, Va., the Chesapeake & Ohio installed a 10-lever desk machine to replace an electro-mechanical machine.

An interesting item in the 1937 program was the first installation in America of the new button-type route control interlocking machine, which was installed at Girard Junction, Pa., on the New York Central to replace a 30-lever electric interlocking machine. At numerous interlockings, 15 of which are listed in the table, extensive rehabilitation was done, the changes including the replacement of semaphores with light signals and the installation of power switch locks on outlying switches.

In the field of remote and centralized traffic control, construction during 1937 included 31 installa-



Four Interlockings Were Consolidated into the Control of One Machine on the Pennsylvania

tions involving about 255 miles of tracks, 143 power switches, 438 controlled signals, and 259 working levers. The most outstanding project completed in 1937 was that of the Burlington between Akron, Colo., and Denver, because it is the first installation of C.T.C. to include a complete operating division, and covering 112 miles of single-track main line. The Missouri Pacific solved a serious operating problem by installing C.T.C. on 8.2 miles of double track and 29.1 miles of single track between Poplar Bluff, Mo., and Peach Orchard, Ark. The Milwaukee combined the control of two interlockings, as well as signals for directing train movements in either direction on each track of 15 miles of double track, into a C.T.C. project between Sturtevant, Wis., and Lake on its Chicago-Milwaukee line. In order to increase track capacity in the vicinity of a division terminal and solve an operating problem during the fruit season, the Denver & Rio Grande Western installed C.T.C. on 13 miles of single track between Grand Junction, Colo., and Palisade, thus deferring indefinitely the need for a second track.

Automatic Interlockings Completed During 1937

Railroad	Location	No. of tracks on reporting road	No. of tracks on other road	No. of Signals	Manufacturer
A. T. & S. F.	Valley Center, Kan.	1	1	6	...
	Burrton, Kan.	2	1	6	...
A. C. L.	Denmark, S. C.	1	1	4	Union
C. N.	L'Epiphanic, Que.	1	1	9	...
	Ellwood, Ont.	1	1	8	...
	Ft. William, Ont.	1	1	7	...
C. P.	Cornwall, Ont.	..	..	9	...
C. R. I. & P.	Ottawa, Ill.	2	1	4	...
C. St. P. M. & O.	Caroline, Minn.*	1	1	6	G.R.S.
	Carney, Minn.*	1	1	6	G.R.S.
D. & R. G. W.	Sandy, Utah	1	1	4	G.R.S.
Ind. Union	Indianapolis, Ind.	..	..	8	Union
M. P.	Van Buren, Ark.	1	1	5	...
N. Y. C. & St. L.	Alexandria, Ind.	2	1	6	...
Pa.	Reed City, Mich.	..	..	5	Union
	Columbus, Ohio	..	..	8	Union
St. L.-S. F.	Winfield, Kan.	1	2	8	Union
S. A. L.	McColl, S. C.	..	..	8	...
Southern	Silver Creek, Ga.	1	1	6	...
S. P. T. & N. O.	Corsicana, Tex.	2	2	12	Union
Wabash	West Unity, Ohio	1	1	8	Union
	Springfield, Ill.	2	2	8	Union
Total plants		22		141	

* 4 smashboards installed

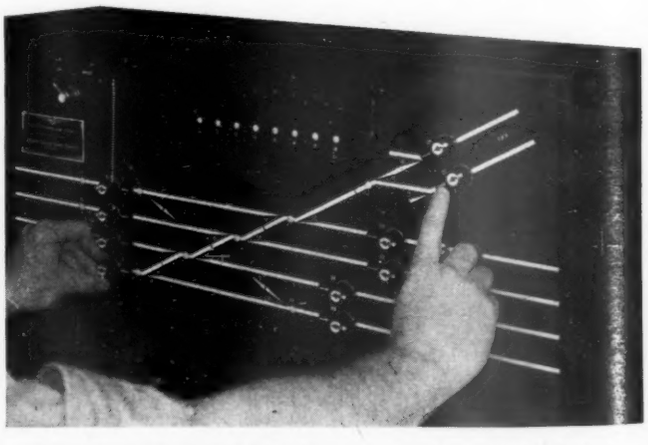
Car Retarders Show New Life

In 1937, car retarder installations were made for the first time since 1930. The Delaware, Lackawanna & Western equipped a yard at Scranton, Pa., including 16 retarders, 30 power switches, 29 skates and 30 signals. The Pennsylvania has practically completed an installation at Enola yard near Harrisburg, Pa., including 20 retarders, 35 power switches, 30 skates and 35 signals. The Wheeling & Lake Erie installed two retarders at a car dumper layout at Huron, Ohio, while the Atlas Portland Cement Company installed two retarders at a yard near Hudson, N. Y. At Clearing yard near Cli-

Interlocking Plants Completed During 1937

Railroad	Location	Manufacturer	Working Levers: Lever Capacity of Frame	Mechanical	Electric	Electro-Mech.: Electric Pneumatic	Mech.	Elec.
A. C. L.	Savannah, Ga.†	Union	..	..	..	..	..	4†
B. & O.	Falls Creek, Pa.	G.R.S.	8	..	8	..	..	..
	Baltimore, Md.	G.R.S.	14	..	14	..	..	..
	Dundas, Ohio	G.R.S.	5	..	5	..	..	..
B. & M.	Nashua, N. H.†	Ry.	..	1†	..	..	..	..
	Barber, Mass.†		..	..	..	..	..	1† ..
C. N.	Lorneville, Ont.		8	5	..	..	..	..
C. of N. J.	Elizabethport, N. J.†	Union	52	..	..	14†	..	..
	Westfield, N. J.	Union	23	..	..	14	..	..
N. Y. & L. B.	Belmar, N. J.	Union	7	..	7	..	..	..
C. & O.	Covington, Va.†	Union	12*	..	11†	..	..	..
	Clyffeside, Ky.†	Union	..	..	..	1†	..	..
	Russell, Ky.†	Union	..	..	..	1†	..	..
	Newport, Ky.†	Union	..	..	..	..	..	1†
	Columbus, Ohio†	Union	..	..	1†	..	..	..
	Cummings, Ohio†	Union	..	..	2†	..	..	..
	Walbridge, Ohio	Union	3	..	3	..	..	..
C. B. & Q.	Bushnell, Ill.	Union	8	..	8	..	..	..
C. R. I. & P.	Bureau, Ill.	Union	6	..	6	..	..	..
	Joliet, Ill.†	G.R.S.	3	..	3†	..	..	..
C. St. P. M. & O.	Merriam, Minn.	G.R.S.	12*	..	12	..	..	..
City of Newark	Newark, N. J.	Union	15	..	..	10	..	..
	Newark, N. J.	Union	3	..	..	3*	..	..
	Newark, N. J.	Union	3	..	..	3*	..	..
	Newark, N. J.	Union	5	..	..	5*	..	..
D. & R. G. W.	Pueblo, Colo.	G.R.S.	..(1)	..	10	..	..	..
Erie	Rutherford, N. J.	Union	19	..	19	..	..	..
Hudson & Manhattan	New York, N. Y.	Union	11	..	..	9	..	..
Ind. Union	Indianapolis, Ind.	Union	8	..	..	..	8	..
L. A. M. T.	Los Angeles, Cal.	G.R.S.	40	..	33	..	..	..
M. P.	Paroquet, Ark.		8	8	..	..	..	..
N. Y. C.	Girard Junction, Pa.†	G.R.S.	..(2)	..	10†	..	..	..
	Kalamazoo, Mich.	G.R.S.	5	..	5	..	..	..
N. Y. C. & St. L.	Kimball, Ohio	Union	4	..	..	..	2	2
	Findlay, Ohio	G.R.S.	4	..	..	..	..	2
N. & W.	Valley Crossing, Ohio†	Union	35	..	7†	..	..	..
Pa.	Delair, N. J.	Union	60(1)	..	42	..	..	..
	Camden, N. J.†	Union	30(1)	..	6†	..	..	..
	Newark, N. J.	Union	..	..	..	25	..	..
Pere Mar.	Reed City, Mich.		3	..	3	..	..	..
P. R. T.	Philadelphia, Pa.	Union	39	..	..	18	..	..
Pub. Ser. Co. Transit	Jersey City, N. J.	Union	3	..	3	..	.	
Southern	Coster, Tenn.	G.R.S.	9	2	5	..	..	..
N. O. & N. E.	Seabrook, La.	G.R.S.	4	..	4	..	..	..
S.P. T. & N. O.	Corsicana, Tex.	Union	5(1)	..	5	..	..	
U. P.	Granger, Wyo.	G.R.S.	12	..	8	..	..	..
			Plants	Levers				
Grand Totals			46	378	16	239	103	11 9
(New)			32	315	15	199	87	10 4
(Rebuilt †)			14	63†	1†	40†	16†	1† 5†

Legend:
† Rebuilt and levers added.
* Table-lever machine.
(1) Miniature lever type, all-relay interlocking.
(2) Button-type, route-control machine.



New Route-Control Interlocking on the New York Central

cago, the Chicago & Western Indiana is installing 22 retarders, 50 power switches and 50 signals.

Automatic Interlockings

During 1937, 22 automatic interlockings were constructed, involving 141 signals and 4 smashboards, effecting savings in operating expenses sufficient, in most cases, to liquidate the investment within two or three years. In most instances, new automatic plants replaced manually-operated interlockings, thus eliminating levermen. At other crossings where interlockings were not previously in service, new automatic plants eliminate train stops and facilitate train movements, thereby increasing average train speeds, as well as reducing wear and tear on equipment sufficiently to justify the cost of the interlockings.

The installation of spring switches at 406 locations showed a large increase, as compared with 216 installations completed in 1936, these spring switches being used where train movements are preponderantly in one direction. Of the installations made in 1937, 25 were at yard switches, 14 at junctions, 20 at ends of double track, and 347 at ends of sidings. An important feature of these installations is the fact that mechanical facing-point locks were provided for 58 of the 1937 installations, as compared with 42 during the previous year. These locks, a comparatively new development, insure practically the same protection for a main-line switch as is offered by interlocking.

The installation of automatic highway crossing protective devices continued at an accelerated rate during 1937, a total of 1,224 crossings being completed last year, as compared with 1,071 in 1936. In addition to the federal and state programs for the protection of crossings, the railroads themselves contributed in increasing measure to the solution of the problem of reducing crossing accidents, for, in addition to the installation of automatic protective devices, the initiation of higher speed trains has required, in many cases, the lengthening of existing control circuits to give adequate warning time; also, the railroads have been actively engaged in providing special control circuits to eliminate

Remote and Centralized Traffic Control Installations Completed in 1937

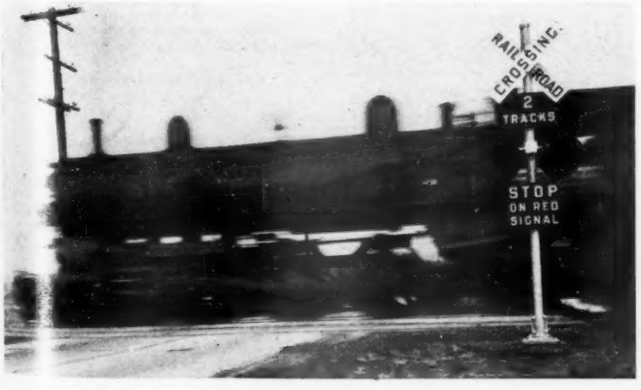
Railroad	Location	Miles of Road	Manufacturer	Direct wire or Coded Control	No. of Levers: Desk Type	No. of Levers: C.T.C. Type	Power Operated Switches	No. of Signals Controlled
A. T. & S. F.	Las Animas, Colo., to Las Animas Jct.	1.5s	Union	DW	2	..	..	4
B. & O.	West Junction, Ohio, to Byers Junction	7.5d	G.R.S.	CD	..	4	2	4
	Arlington, N. Y., to Mariners Harbor	0.5f	G.R.S.	CD	..	5	3	8
	Musselman, Ohio, to R K Junction	2.1d	G.R.S.	DW	7	..	6	8
C. P.	Trois Rivieres, Que., to Cap De La Madeleine	3.7s	G.R.S.	DW	..	5	2	5
C. of Ga.	Muscogee, Ga.	..	Union	DW	..	..	1	3
C. & O.	S. Ruffner, W. Va., to M. P. 451	0.9d	Union	DW	2	..	1	3
C. B. & Q.	Akron, Colo., to Derby	112.0s	Union	..	..	86	40	170
	Burch, Iowa, to Des Moines	2.5s	G.R.S.	..	..	4	1	7
	La Clede, Mo.	1.0s	G.R.S.	..	2	..	1	4
C. G. W.	Des Moines, Iowa, to Burch	2.1s	G.R.S.	DW	..	4	1	6
C. M. St. P. & P.	Sturtevant, Wis., to Lake	14.9d	Union	CD	..	10	8	24
D. L. & W.	Mountain View, N. J., to Lincoln Park	1.0f	Union	DW	4	..	2	4
D. & R. G. W.	Grand Junction, Colo., to Palisade	13.0s	G.R.S.	CD	..	19	12	34
	Pueblo, Colo.	..	G.R.S.	DW	..	4	2	8
	Thistle, Utah	..	G.R.S.	DW	..	4	2	8
Ind. Union	Indianapolis, Ind.	yard	Union	DW	..	8	3	8
	Indianapolis, Ind.	yard	Union	DW	..	14	9	9
	Indianapolis, Ind.	yard	Union	DW	2	..	1	3
L. & N.	Baxter, Ky.	..	G.R.S.	DW	5	..	2	9
M. P.	Poplar Bluff, Mo.	1.9d	G.R.S.	DW	4	..	2	6
	Poplar Bluff, Mo., to Peach Orchard, Ark.	29.05s 6.25d	G.R.S.	CD	..	28	16	39
N. Y. C.	Bay Bridge, Ohio	0.9d	G.R.S.	DW	2	..	2	6
N. & W.	Vulcan, W. Va.	..	Union	..	..	..	2	12
Pa.	Girard, Ohio, to Youngstown	2.3d	Union	DW	5	..	6	6
	Detour, Ohio, to Niles	1.6d	Union	DW	4	..	3	5
	Sterling Run, Pa., to Huntley	5.07s	Union	CD	..	6	2	6
	Crestline, Ohio	1.03d						
	Crestline, Ohio	..	Union	CD	..	4	2	6
S. P.	Lathrop, Cal.	wye	Union	DW	11	..	8	20
	Hathaway, Cal., to San Luis Obispo	0.83s	Union	DW	..	4	1	3
	Totals	170.75s 39.38d 1.5f			50	209	143	438
	Grand Total	211.63						

Legend:
In "Miles of Road" column: s = Single track, d = Double track, f = Four track.

Flashing-Light Signals Supplemented by Short Arm Gates on the Milwaukee

Car Retarder Installations During 1937

Railroad	Location	No. of Class Tracks	No. of Towers	No. of Retarders	Rail Feet Retarders	No. of Power Switches	No. of Switch Signals	No. of Power Skates	Manufacturer
Atlas Portland Cement	Hudson, N. Y.	1	1	2	66	..	..	..	Union
D. L. & W.	Scranton, Pa.	29	2	16	923	30	30	29	Union
Pa.	Harrisburg, Pa.	33	3	20	1,448	35	35	30	Union
W. & L. E.	Huron, Ohio	2	1	2	60	..	..	..	G.R.S.
	Totals			40	2,497	65	65	59	



Flashing-Light Signals Were Installed at More than 1,000 Crossings During 1937

unnecessary operation of the warning devices during switching, station stops and passage of slow-speed trains.

Although the number of installations of highway crossing protection financed by federal funds declined from 638 in 1936 to 612 in 1937, the railroads paid for 484 installations in 1937 as compared with 369 in 1936; the states provided funds for 96 projects in 1937 as compared with 48 in 1936; and counties and cities paid the expenses of providing protection at 25 crossings in 1937 as compared to 15 in 1936; also, 6 private crossings were protected in 1937 with private funds.

A total of 2,683 protective units were provided at the 1,225 crossings protected in 1937. These included 2,092 flashing-light signals, 292 wig-wag signals, 189 rotating disk stop signals, 21 traffic type stop-and-go signals, 65 automatic gates, 16 barriers, and 8 floodlights. Compared with 1936, the installations in 1937 involved the provision of 532 more flashing-light signals, 11 more wig-wag signals, 19 more automatic gates, 10 more barriers, 126 less rotating disk type signals, and 11 less traffic-type signals.

The year also saw more use being made of flood-lighting as a form of crossing protection, designed particularly to deter motorists from running into the sides of trains, a total of 8 such installations having been made during the year. About 1,757 of the flashing-light crossing signals installed in 1937 were equipped with the standard A.A.R. reflector type "stop on red signal sign" although the automatically illuminated "stop" sign, also an A.A.R. standard, was used on 335 signals.

Increased interest was shown, in 1937, in the installation of automatic gates, especially at multiple-track crossings where "second-train" accidents were prevalent. In

(*Continued on page 94*)

Spring Switches Installed During 1937

Railroad	Total No. of Spring Switches Installed	Classification as to Application: End of Passing Track	End of Double Track	Junction	Yard Track	Total No. Equipped with Facing Point Lock	Signal Protection: High Signals	Dwarf Signals
A. T. & S. F.	18	17	..	..	1	..	..	..
B. & O.	1	1	..	..	..	..	1	2
B. & M.	2	1	1	..	..	..	..	1
C. N.	2	..	1	..	1	1	2	1
C. P.	2	..	..	2	..	2	4	..
C. of Ga.	1	..	1	..	..	..	4	..
C. & O.	19	18	..	1	..	6	9	18
C. & E. I.	1	..	..	1	..	..	1	..
C. & N. W.	3	..	1	1	1	3	..	..
						1*		
C. B. & Q.	8	6	1	..	1	6	8	..
C. G. W.	1	..	..	..	1	1	2	1
C. M. St. P. & P.	13	10	..	1	2	5	11	5
C. R. I. & P.	10	7	..	2	1	2*	7	3
Colo. & Sou.	1	..	1	..	..	..	4	..
D. & H.	1	1	..	..	..	..	2	1
D. L. & W.	3	2	..	..	1	..	3	3
D. & R. G. W.	5	1	..	..	4	5	2	5
Erie	2	2	..	..	..	..	..	2
G. N.	4	..	3	..	1	3	7	1
L. & N.	2	1	..	..	1	..	3	..
M. St. P. & S. S. M.	1	1	..	..	..	..	1	..
M. P.	2	..	..	1	1	..	2	..
M. P. in Neb.	2	1	..	1	..	..	2	..
G. C. L. & I.-G. N.	2	..	1	..	1	..	2	..
N. Y. C.	1	1	..	..	..	1	2	..
N. Y. C. & St. L.	1	..	..	1	..	..	2	1
N. Y. O. & W.	1	..	1	..	..	..	..	..
N. & W.	7	7	..	..	..	..	5	14
Pa.	2	..	2	..	..	2	2†	..
Reading	1	..	1	..	..	1	1	..
R. F. & P.	1	..	..	..	1	..	..	..
St. L.-S. F.	1	..	..	..	1	..	2	..
S. A. L.	14	13	1	..	..	14	..	..
Southern	188	185	1	1	1	..	2	..
C. N. O. & T. P.	17	17	..	..	..	..	..	..
A. G. S.	18	18	..	..	..	..	..	..
N. O. & N. E.	13	13	..	..	..	..	..	..
Nor. Ala.	9	9	..	..	..	..	..	..
S. P.	4	3	1	..	..	2	8	3
T. & N. O.	6	4	..	2	..	..	5	..
T. & P.	2	1	..	..	1	..	2	2
U. P.	2	2	..	..	..	1	1	3
Virginian	5	1	2	..	2	..	5	..
Wabash	1	1	..	..	..	1	4	1
W. M.	5	3	..	..	2	..	8	..
W. & L. E.	1	..	1	..	..	1	1	..
Totals	406	347	20	14	25	58	127	67

* Facing-point lock added to existing switch.
† Home and distant switch indicators.

Highway-Railroad Grade Crossing Protection Installed in 1937

Railroad	No. of Crossings Protected	Sources of Funds: Railroad	Federal	State	County City Private†
Alton	12	8	..	4	..
A. T. & S. F.	72	38	32	1	1
A. & W.P.	3	..	3	..	..
Ga.	4	..	4	..	..
A. C. L.	46	..	46	..	..
B. & O.	59	44	15	..	..
Bg. & Ar.	1	1	..	..	..
B. & M.	24	15	7	..	2
C. N.	48	12.75	26.40	8.75	0.10†
G. T. W.	7	3.50	..	1.50	2
C. P.	11	1.50	8	0.90	0.60
C. of N. J.	1	..	1	..	..
C. V.	3	..	2	..	1†
C. & O.	2	1	1	..	..
Ches. & West.	2	2	..	..	..
C. & E. I.	17	11	6	..	..
C. & N. W.	24	6	18	..	..
C. B. & Q.	25	6.50	16	0.50	2†
C. G. W.	2	..	1	..	1
C. I. & L.	22	2	20	..	..
C. M. St. P. & P.	42	17	12.50	12.50	..
C. R. I. & P.	23	17	6	..	..
C. St. P. M. & O.	3	2	1	..	..
Cum. & Pa.	3	3	..	..	..
D. & H.	4	2	2	..	..
D. L. & W.	5	5	..	..	..
D. & R. G. W.	7	7	..	..	..
D. T. & I.	4	0.50	3	0.50	..
D. M. & I. R.	6	..	6	..	..
Dur. & Sou.	7	..	7	..	..
E. J. & E.	1	1	..	..	..
Erie	25	19	..	5	1†
F. E. C.	1	1	..	..	..
Ft. S. & W.	1	..	1	..	..
F. W. & D. C.	20	..	20	..	..
Ga. & Fla.	1	..	1	..	..
Gr. Nor.	8	3	5	..	..
G. M. & N.	13	..	13	..	..
I. C.	24	12	..	12	..
Y. & M. V.	1	..	..	1	..
Indiana	3	..	3	..	..
L. & N. E.	2	2	..	..	..
L. & N.	14	7	7	..	..
Me. Cen.	4	1	3	..	..
M. & St. L.	8	0.50	7	0.50	..
Mo. & Ark.	7	..	7	..	..
M-K-T	9	..	..	9	..
M. P.	26	14	12	..	..
M. P. in Neb.	5	..	5	..	..
G. C. L.	1	..	1	..	..
I.-G. N.	7	4	3	..	..
M. & O.	2	..	..	2	..
N. C. & St. L.	19	12	7	..	..
N. Y. C.	31	22	6	3	..
C. R. & I.	1	1	..	..	..
C. C. C. & St. L.	20	10	..	8	2
M. C.	5	2	3	..	..
P. & E.	14	13	1	..	..
P. & L. E.	2	1.50	..	0.50	..
Rutland	2	..	2	..	..
N. Y. C. & St. L.	19	7	12	..	..
N. Y. N. H. & H.	9	9	..	..	..
N. & W.	16	11	5	..	..
Nor. Sou.	22	..	22	..	..
N. P.	5	..	4	..	1
N. W. P.	2	..	2	..	..
Pac. Elec.	15	3.25	..	5	6.75
Pa.	102	61	39	1	1†
L. I.	7	7	..	..	..
P. M.	2	0.30	1	0.70	..
Pied. & Nor.	6	..	6	..	..
Que. Cen.	1	0.30	0.40	0.30	..
Reading	1	1	..	..	..
Sac. Nor.	2	0.50	..	1.50	..
St. L.-S. F.	17	3	..	14	..
St. L. S. W.	3	..	3	..	..
S. A. L.	42	2	40	..	..
Southern	30	..	30	..	..
A. G. S.	1	1	..	..	..
G. S. F.	1	..	1	..	..
S. P.	43	24	7	4	7
T. & N. O.	39	5	34	..	..
Tenn. Cen.	1	..	1	..	..
T. & P.	9	3.50	5	0.50	..
U. P.	42	1	39	..	2
Wabash	6	6	..	..	..
West. Md.	5	..	5	..	..
W. P.	3	1	2	..	..
W. & L. E.	8	6	2	..	..
Totals	1,225	484.60	611.30	97.65	25.35 6.10†

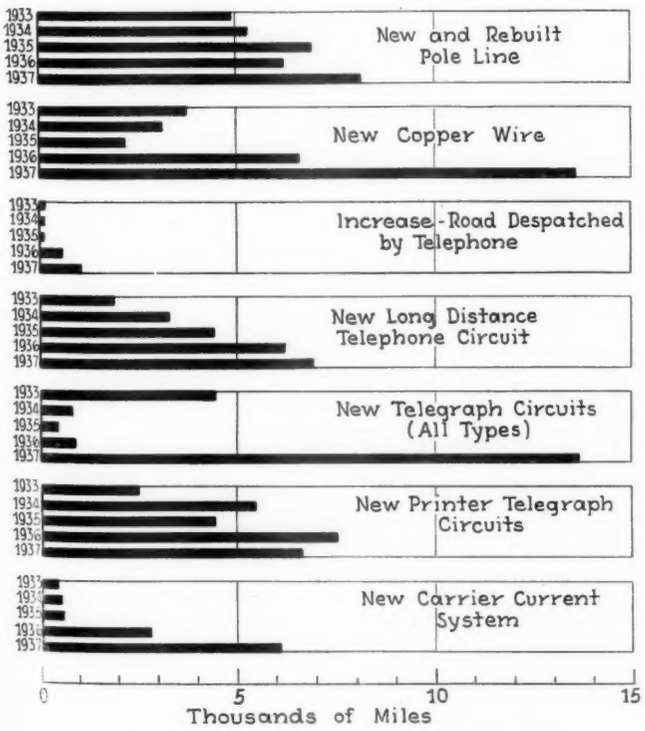
T. & T. Construction Accelerates

Mileages of telegraph and carrier-current circuits, and of new copper wire show substantial increases during 1937

By E. J. Phillips
Associate Editor

ADDITIONAL long distance telephone and telegraph facilities, as well as a marked increase in mileage of new copper wire installed, featured the activity in the railroad communication field during 1937. According to reports from 115 railroads in the United States and Canada, the upturn in construction which took place in 1936 was continued at an even faster pace during 1937.

The accompanying chart emphasizes the accelerated activity which took place in various phases of the field in 1937 as compared with 1933, 1934, 1935 and 1936. Particularly outstanding were the increased mileages of new copper wire, new telegraph circuits, new carrier-current systems, and of road dispatched by telephone. In addition, extensive installations of printing telegraph circuits and machines were made, an increased mileage of pole line was constructed or rebuilt, and an increased number of miles of road were provided with telephone train dispatching.



Telephone and Telegraph Construction Activity

Comparison of the activity in 1937 with that of 1936, as represented by the summary in Table A of the figures reported by 115 railroads in the United States and Canada, indicates a 1,320 per cent increase in new mileage of all types of telegraph circuits, 115 per cent increase in new mileage of carrier-current systems, 106 per cent increase in new mileage of copper wire, 82 per cent increase in mileage of road dispatched by telephone, 32 per cent increase in mileage of new or rebuilt pole line, and 11 per cent increase in new mileage of long distance telephone circuits. Although the new mileage of printing telegraph circuits installed in 1937 decreased 11 per cent from that installed in 1936, 56 per cent more new printing telegraph machines were installed in 1937 than in 1936.

Table A—Principal Increases in Communication Plant Facilities in the United States and Canada During 1937, as Compared with 1936

	1937	1936
Miles of new or rebuilt pole line:		
Railroad owned	2,932	2,040
Commercially owned	2,817	2,357
Jointly owned	2,427	1,808
Total	8,176	6,205
Miles of new copper wire:		
Railroad owned	9,275	4,688
Commercially owned	4,329	1,906
Total	13,604	6,594
Gross increase in miles of road dispatched by telephone	1,094	600
Increase in miles of long distance telephone circuits	6,946	6,250
New mileage of telegraph circuits, all types	13,668	966
Increase in miles of printing telegraph circuits	6,683	7,546
Number of new printing telegraph machines	109	70
Increase in miles of new carrier-current systems	6,105	2,844

Probably the figures most indicative of the active improvement of communication plant facilities are the reports of new telegraph circuits of all types, which increased from 966 miles in 1936 to 13,668 miles in 1937. The Canadian National reported an increase of 9,943 miles, which included new mileage obtained by the use of a carrier-current system. The Canadian Pacific reported 2,374 new miles of telegraph circuits and the Denver & Rio Grande Western 558 new miles.

Increased use of carrier-current systems was reported by several railroads, the largest installations including

2,313 miles by the Canadian National, 800 miles of a three-channel voice carrier between Salt Lake City, Utah, and Los Angeles, Calif., by the Union Pacific system, 724 miles of long distance telephone carrier by the Southern Pacific Lines in Texas and Louisiana, 443 miles by the Southern, 436 miles by the New Haven, and 333 miles by the Burlington.

The principal installations of new copper wire are indicated in Table B, while the principal installations of new printing telegraph systems are shown in Table C.

Roads showing the largest installations of telephones for train dispatching included the Southern with 452 miles of road reported, the Wabash with 153 miles, the Denver & Rio Grande Western with 128 miles, the Chicago, St. Paul, Minneapolis & Omaha with 117 miles, and the Santa Fe with 113 miles.

The trend to improved long-distance telephone circuits was indicated by the continued activity in this phase of the work, the Canadian Pacific reporting 1,239 miles, the Union Pacific system 1,121 miles, the Texas & New Orleans 724 miles, the Illinois Terminal 464 miles, the Denver & Rio Grande Western 450 miles, the Burlington 338 miles, the Southern 318 miles, and the Southern Pacific 305 miles.

Outstanding figures for new or rebuilt railroad-owned pole line were shown by the Pennsylvania reporting 517 miles, by the Louisville & Nashville reporting 496 miles, and by the Chicago & North Western reporting 453 miles.

Table B—Principal Copper Wire Installations Completed in the United States and Canada During 1937

	Miles of New Copper Wire		
	Railroad Owned	Commercially Owned	Total
Canadian National	69	1,654	1,723
Canadian Pacific	4,627	...	4,627
Chicago, St. Paul, Minneapolis & Omaha	234	100	334
Delaware, Lackawanna & Western	30	545	575
Denver & Rio Grande Western	1,155	...	1,155
Seaboard Air Line	96	293	389
Southern	5	753	758
Southern Pacific	402	181	583
Union Pacific (System)	750	...	750
Wheeling & Lake Erie	...	322	322

Table C—Principal Printing Telegraph Installations Completed in the United States and Canada During 1937

	Miles of Circuit	Number of Machines
Atchison, Topeka & Santa Fe	1,647	36
Canadian National	1,004	4
Canadian Pacific	999	16
Chicago, Burlington & Quincy	333	2
Chicago, Rock Island & Pacific	1,000	7
Erie	1,276	4

The trends indicated by the 1937 activity show an increased effort on the part of communication engineers to meet the need for better railroad communication facilities by the installation of long distance telephone systems, printer telegraph equipment, and carrier-current systems. Still another trend is indicated by the increased use of train telephone systems as part of the equipment on the new light-weight and streamlined trains. One of the largest communication projects under way at the close of the year was in connection with the Pennsylvania electrification project involving the lines in the Philadelphia-Harrisburg area, where the open wire communication lines are being placed in aerial cable under gas pressure for a distance of approximately 300 miles.

Signaling Construction Increased in 1937

(*Continued from page 92*)

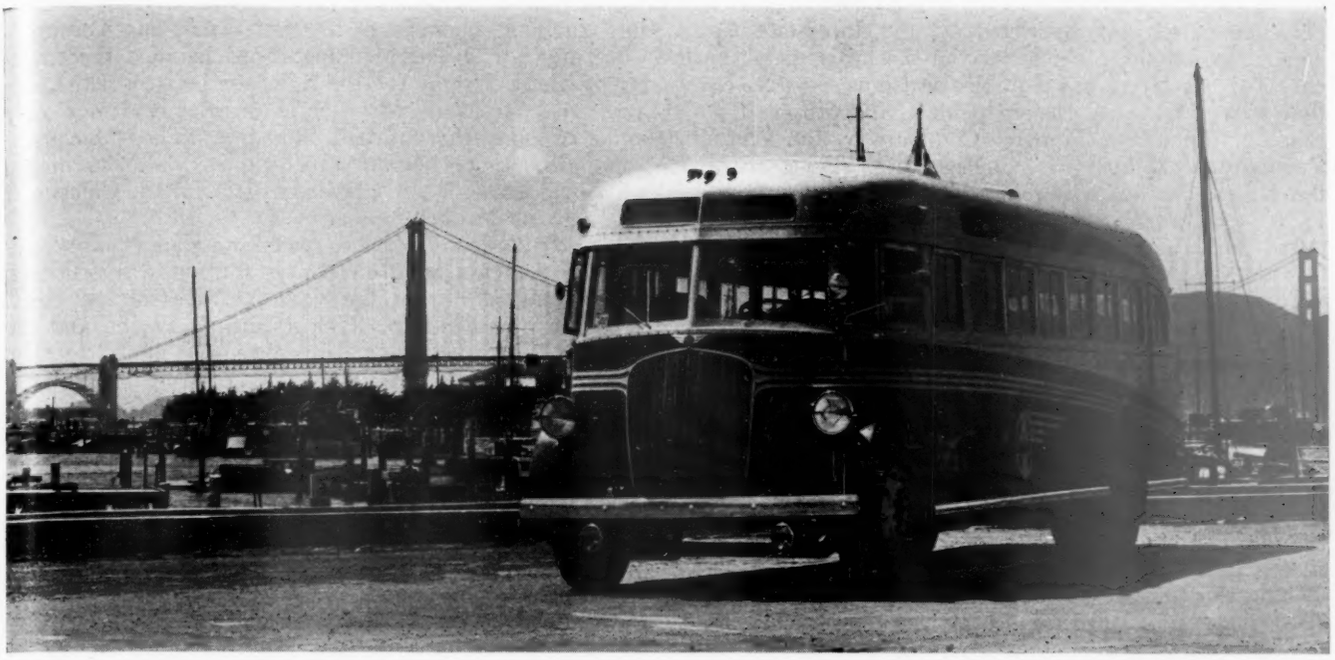
such locations, at crossings already equipped with flashing-light signals, short-arm gates, extending half-way across the pavement, are being added as auxiliary protection. Eight crossings were equipped with fixed barriers, of the type that rise out of the level of the pavement, in 1937, as compared with 3 in 1936.

Table of Crossing Protection Installed in Different States Separated As to Sources of Funds

State or Province	No. of Crossings	Sources of Funds: Railroad	Federal	State	City County Private†	Total Protection Units
Ala.	4	2	..	2	..	8
Ariz.	4	..	4	..	..	8
Ark.	26	2	23	1	..	60
Calif.	77	32.75	15	11.50	16.75 1†	164
Colo.	13	6	7	..	..	26
Conn.	2	1	..	..	1†	4
Fla.	1	1	..	..	..	2
Ga.	18	4	14	..	..	66
Idaho	18	..	17.50	0.50	..	36
Ill.	98	83	4	6	3 2†	238
Ind.	157	36	107	14	..	353
Iowa	19	12	5.50	1.50	..	42
Kan.	38	33	1	4	..	84
Ky.	14	6	6	2	..	32
La.	3	2.50	..	0.50	..	4
Maine	4	2	2	..	..	10
Md.	11	3	8	..	..	25
Mass.	23	20	1	..	2	49
Mich.	16	9	..	5	2	36
Minn.	19	4	15	..	..	47
Miss.	9	..	6	3	..	23
Mo.	11	10	1	..	..	20
Mont.	2	1	1	..	..	4
Neb.	26	2	24	..	..	52
Nev.	1	..	1	..	..	2
N. H.	6	2	4	..	..	11
N. J.	16	14	1	..	1†	33
N. M.	3	1	2	..	..	8
N. Y.	33	33	..	..	..	76
N. C.	93	..	93	..	..	198
N. D.	1	..	1	..	..	2
Ohio	79	74	5	..	..	181
Okla.	18	2	6	10	..	36
Ore.	10	1	9	..	..	19
Pa.	23	17.50	..	4.50	1†	59
R. I.	1	1	..	..	..	2
S. C.	34	2	32	..	..	71
S. D.	31	..	25	6	..	62
Tenn.	29	9	16	4	..	66
Tex.	109	17	85	7	..	203
Utah	3	2	1	..	..	6
Vt.	13	..	13	..	..	38
Va.	24	7	17	..	..	51
Wash.	6	1	2.50	1.50	1	12
W. Va.	8	2	6	..	..	16
Wis.	19	12	4	3	..	41
B. C.	2	0.30	1.40	0.30	..	4
N. B.	6	2.60	2.80	0.60	..	11
N. S.	7	1	4.90	1	0.10†	9
Ont.	28	8.05	11.50	8	0.45	51
P. E. I.	2	0.30	1.40	0.30	..	3
Sask.	1	0.15	0.70	..	0.15	2
Que.	6	2.45	3.10	0.45	..	17
Totals	1,225	484.60	611.30	97.65	25.35 6.10†	2,683

Train Control and Cab Signaling

During 1937, the most important item in the field of train control and cab signaling was the installation of code-control of wayside signals and cab signaling on the Pennsylvania's lines between Philadelphia, Pa., and Harrisburg, as a part of the electrification program in this territory. Also, the New Haven discontinued operation of the automatic brake application feature of its installations and now operates by cab signals in conjunction with wayside signals on 163 road miles. On various roads new locomotives and new streamlined trains were equipped with modern types of locomotive equipment for operation on train control and cab signal territory, approximately 275 sets of locomotive equipment being installed during 1937.



New Buses of the Most Modern Type Were Purchased in Large Numbers by the Railways

Motor Transport Operations Continue to Grow

New subsidiaries organized and activities of existing companies expanded during year

By Charles Layng,
Motor Transport Editor

THE railways continued to expand their motor transport activities during 1937. This was particularly true in the trucking field where highway subsidiaries were organized by railways that had not heretofore engaged in such operations, and the activities of several existing subsidiaries were vastly increased. While the bus-operating subsidiaries continued their expansion in many cases, the effect of lower passenger fares on the railways was keenly felt in other instances, and certain proposed consolidations are directly attributable to these lower railway fares.

Direct Ownership Grows

The trend toward direct ownership of highway vehicles by the railways, instead of contracting with outside firms, continued during the year. In those numerous cases where the railways still contract for collection and delivery service, a closer supervision of such operations by the railways is being maintained. This service, once its value was demonstrated, spread like wildfire until it became universal a few years ago.

Under the circumstances, the contracts entered into with the owners of the more than 100,000 trucks engaged exclusively in railway pick-up and delivery service were extremely varied, in view of the short time allowed for their consummation and the inexperience of many railways at that time in activities of this sort. Most of these first contracts have now expired, and, in renewing them, the railways have insisted upon greater supervision of these operations, and particularly on the right to exercise control over the purchase of trucks to be used in railway service exclusively.

Activities Hampered

The railways were also active during 1937 in the attempted purchase of truck lines for the purpose of establishing a better and more flexible service in handling merchandise freight. Many operations were arranged for the handling of l. c. l. traffic on high-speed trains to specific concentration and distribution points and thence to and from the local stations by highway truck.

The conspicuous success of several railways in increasing traffic by this form of endeavor was instrumental in encouraging other railways to do likewise.

In such activity, however, the roads were consider-

ably hampered and restricted by the Interstate Commerce Commission, which delayed the hearings on such cases or rendered unfavorable decisions on the cases that were heard. A case in point is the proposed purchase of the Union Transfer Company by the Chicago, Burlington & Quincy, the Chicago & Northwestern and the Union Pacific, acting jointly, on which proposal an I.C.C. examiner rendered a report approving the proposed purchase in November, 1936, but the commission has not yet announced its decision.

Again, on June 12, the I. C. C. decided in the Scott Brothers case that a railroad-owned trucking company is subject to Section II of the Motor Carrier Act and is a contract carrier.

Is C. & D. Under Motor Act?

Commissioner Eastman, dissenting, held that trucking firms engaged in pick-up and delivery service should not be regulated under the Motor Carrier Act, but should be treated in the same manner as the railroads owning them so far as regulation is concerned. He argued that the commission, even on this basis, would still have ample regulatory powers, a statement with which the railways were in thorough accord. While this case involved specifically only the Pennsylvania and the Long Island, its implications and the precedents set were such as to involve the entire railway motor transport industry, and railways from all over the country have entered the case as petitioners in the rehearing now in progress.

Relief for the carriers along these lines was promised by Commissioner Eastman in a speech made on November 16 in which he said that a special report would be made to Congress by the commission, recommending the alteration of certain features of the Motor Carrier Act. "The regulatory body's worst fault," he said, "has been our frequent inability to act as promptly as the best interests of all concerned require."

The Truck Situation

During the year, the St. Louis-San Francisco, the Chicago, Rock Island & Pacific, the Illinois Central and other railroads took steps to organize motor trucking subsidiaries for inter-city runs in co-ordinated service. The Texas & Pacific and the Missouri Pacific increased such services from a few scattered runs to systems operating several thousand truck miles daily and covering practically the entire systems. The Southern Pacific continued the spectacular success of the operations of its various motor transport subsidiaries, while the Northern Pacific and the Great Northern continued to expand their co-ordinated trucking systems in Montana.

The Kansas City Southern, the Gulf, Mobile & Northern and the Seaboard Air Line, all of which have trucking subsidiaries, applied for permission to provide system-wide expansion of these activities. The New England roads, firmly established in the highway field, continued and expanded their successful operations.

The Pennsylvania consolidated and perfected its system-wide concentration and distribution plan, while the New York Central entered into an arrangement with the Railway Express Agency for trucking its l. c. l. freight in Northern New York on a co-ordinated basis. The Express Agency has been particularly active throughout the year in selling its truck services to the railways for inter-city operations as well as for collection and delivery service.

The Missouri Pacific, early in the fall, turned over its trucking operations to the Columbia Terminals Company. This latter company has handled the transfer of l. c. l. freight for the railroads between St. Louis and East St. Louis for several decades and is closely affiliated with the railroad industry. The same company also began operation of inter-city trucks in the St. Louis area for the Cleveland, Cincinnati, Chicago & St. Louis in October.

The truck-ferry service, whereby trailers are handled on flat cars by the railways for highway truckers, was continued during the year by the Chicago Great Western; the Chicago, Rock Island & Pacific and the Chicago, North Shore & Milwaukee.

The Bus Situation

The proposals to consolidate the bus operations of the Burlington Transportation Company with those of the Interstate Transit Lines, operated by the Union Pacific and the Chicago & North Western; and to merge the long distance bus operations of the New Haven's bus subsidiary, the New England Transportation Company, with those of the New England Greyhound Lines, are stated to be the result of lower passenger fares on the railways. The commission has not yet given its approval of either of these mergers, but the plan is in each case for all companies concerned to participate in the operation of the consolidated lines on a partnership basis and eliminate what is said to be needless competition.

Both the Greyhound Lines and the National Trailways, and particularly the railroad affiliates of these systems, have engaged in a widespread program of bus terminal improvement which has resulted in the building of some 15 new major bus stations and many smaller ones.

The growth of train connection bus services has been a feature of the year. The Union Pacific and the Baltimore & Ohio, in the Los Angeles and New York areas, respectively, have both improved and expanded such services. During the year also, the Atchison, Topeka & Santa Fe has made arrangements for a train connection bus service over the new Bay bridge between Oakland and San Francisco, the buses to operate to and from a new station built during the year in downtown San Francisco.

Non-Revenue Service Market

Aside from the direct transportation services the demand for buses and trucks for use in non-revenue service by the railways has grown materially during the year. Many roads have been supplanting shuttle-train service for their employees with highway bus service in certain localities. The Missouri-Kansas-Texas has been particularly active in this respect. During the year also, several roads, including the Chicago, Rock Island & Pacific, have motorized water service and paint gangs, through the purchase of highway trucks. This field is a fast-growing one.

Orders for Highway Vehicles

The appended list of highway equipment ordered is necessarily incomplete, since it does not include replacements to the fleet of nearly 100,000 trucks used exclusively in railroad collection and delivery service. It is given as a partial survey of the possibilities of the market, and shows that, during 1937, the railways questioned purchased 771 motor coaches, 1,692 units of highway freight equipment and 198 automobiles.

Orders for Highway Vehicles

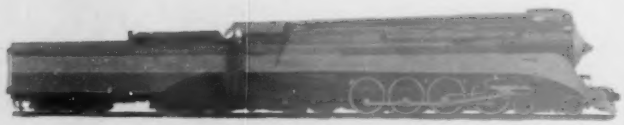
Purchaser	No.	Type of vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Atchison, Topeka & Santa Fe					
Santa Fe Transportation Company (California)	3	Truck	1½ ton	Rev.	Ford
	2	Truck	4-5 ton	Rev.	International Harvester
	1	Truck	1½ ton	Rev.	Chevrolet
	1	Truck	2 ton	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Ford
	1	Truck	1½ ton	Rev.	Studebaker
	1	Truck	1½ ton	Rev.	Dodge
	1	Tractor	3½-5 ton	Co. Business	General Motors
	1	Tractor	3½-7 ton	Rev.	General Motors
	1	Trailer	14 ton	Rev.	Utility Trailer Sales Company
	1	Trailer	8 ton	Rev.	Utility Trailer Sales Company
	1	Trailer	8 ton	Co. Business	Cochran & Celli
	1	Trailer	11 ton	Rev.	Fruehauf
Baltimore & Ohio	10	Bus	22	Rev.	White
	1	Truck	3½ ton	Co. Business	General Motors
	1	Truck	2½ ton	Co. Business	Ford
	1	Truck	½ ton	Co. Business	Ford
	5	Automobile	.....	Co. Business	Chevrolet
	4	Automobile	.....	Co. Business	Plymouth
	3	Automobile	.....	Co. Business	Ford
Bangor & Aroostook					
Bangor & Aroostook Transportation Company	1	Bus	33	Rev.	General Motors
	1	Bus	10	Rev.	Chevrolet
Bessemer & Lake Erie	1	Truck	¾ ton	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Chrysler
Boston & Maine	7	Bus	21	Rev.	General Motors
	11	Truck	6 ton	Rev.	General Motors
	6	Truck	7 ton	Rev.	General Motors
	5	Truck	5 ton	Rev.	General Motors
	3	Truck	½ ton	Co. Business	Ford
	2	Truck	5 ton	Rev.	Autocar Company
	1	Truck	7½ ton	Rev.	General Motors
	1	Truck	4½ ton	Co. Business	General Motors
	1	Truck	1½ ton	Co. Business	Ford
	6	Tractor	.....	Rev.	General Motors
	10	Trailer	12 ton	Rev.	Trailer Company of America
	2	Automobile	5	Co. Business	Ford
Central of Georgia	1	Bus	40	Rev.	Mack
	1	Automobile	5	Co. Business	Chevrolet
Chesapeake & Ohio	3	Bus	.....	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Ford
	1	Automobile	5	Co. Business	Ford
	1	Automobile	.....	Co. Business	Chevrolet
Chicago & Illinois Midland	2	Truck	.....	Co. Business	International Harvester
	3	Automobile	5	Co. Business	Oldsmobile
	3	Automobile	5	Co. Business	Chevrolet
Chicago, Burlington & Quincy	2	Truck	1½ ton	Co. Business	Ford
	2	Truck	1 ton	Co. Business	Ford
	2	Truck	¾ ton	Co. Business	International Harvester
	3	Automobile	5	Co. Business	Ford
	1	Automobile	5	Co. Business	Chevrolet
	1	Automobile	2	Co. Business	Ford
Burlington Transportation Company	1	Truck	1½ ton	Rev.	Chevrolet
	2	Tractor	3 ton	Rev.	White
	2	Tractor	3 ton	Rev.	International Harvester
	1	Tractor	1½ ton	Rev.	International Harvester
	6	Trailer	10 ton	Rev.	Fruehauf
	1	Automobile	2 ton	Rev.	Chevrolet
Chicago, Indianapolis & Louisville	1	Truck	.....	Co. Business	Ford
Monon Transportation Company	1	Truck	1½ ton	Rev.	Chevrolet
Chicago, Milwaukee, St. Paul & Pacific	2	Bus	16	.....	.....
	1	Truck	1¼ ton	.....	.....
	1	Truck	½ ton	.....	.....
	4	Trailer	.....	.....	.....
	9	Automobile	5	.....	.....
Chicago, St. Paul, Minneapolis & Omaha					
Wilson Transportation Company	2	Tractor	.....	Rev.	General Motors
	2	Trailer	5	Rev.	General Motors
Chicago, South Shore & South Bend	1	Bus	21	Rev.	Studebaker
	1	Truck	¾ ton	Co. Business	International Harvester
	1	Truck	1 ton	Co. Business	International Harvester
Colorado & Southern					
Denver & Interurban Motor Company	1	Bus	36	Rev.	General Motors
Cumberland & Pennsylvania	1	Automobile	5	Co. Business	General Motors
Delaware, Lackawanna & Western	1	Truck	1½ ton	Co. Business	Diamond T
	1	Truck	1½ ton	Co. Business	Ford
Detroit & Mackinac	1	Truck	.....	Co. Business	Chevrolet
Detroit, Toledo & Ironton	1	Truck	.....	Co. Business	Ford
	10	Automobile	.....	Co. Business	Ford
Duluth, Missabe & Iron Range	1	Truck	1½ ton	Co. Business	Chevrolet
Elgin, Joliet & Eastern	1	Truck	1½ ton	Co. Business	.....
	1	Truck	½ ton	Co. Business	.....
	1	Truck	1 ton	Co. Business	.....
Erie	6	Truck	1½ ton	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	Dodge
	1	Truck	1½ ton	Co. Business	Ford
	5	Automobile	5	Co. Business	Chevrolet
	3	Automobile	5	Co. Business	Plymouth
	1	Automobile	2	Co. Business	Plymouth
	1	Automobile	5	Co. Business	Dodge
	1	Automobile	5	Co. Business	Ford
	1	Automobile	2	Co. Business	Ford
	1	Automobile	2	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Buick
	1	Automobile	5	Co. Business	Willys-Overland
Fonda, Johnstown & Gloversville	3	Bus	21	Rev.	General Motors
	2	Bus	32	Rev.	General Motors
Great Northern	1	Tractor	5 ton	Rev.	.....
	1	Trailer	10 ton	Rev.	.....
Northland Greyhound Lines, Inc.	40	Bus	37	Rev.	General Motors
	10	Bus	11	Rev.	Ford
	1	Automobile	.....	Co. Business	Ford
Green Bay & Western	1	Truck	1½ ton	Co. Business	Ford
	1	Automobile	5	Co. Business	Ford
Gulf Coast Lines	1	Truck	.....	.....	General Motors
	3	Automobile	.....	.....	General Motors
	2	Automobile	.....	.....	Chrysler
	1	Automobile	.....	.....	Ford

Purchaser	No.	Type of vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Gulf, Mobile & Northern					
Gulf Transport Company	1	Bus	23-27	Rev.	Dittmar Manufacturing Company
	1	Bus	24-29	Rev.	Fitzjohn Body Company
	2	Truck	2-2½ ton	Rev.	White
	1	Tractor	1½-2 ton	Rev.	International Harvester
	1	Trailer	2 ton	Rev.	International Harvester
	1	Trailer	2 ton	Rev.	Fruehauf
	1	Automobile	5	Rev.	Plymouth
Illinois Central	3	Truck	2 ton	Co. Business	Ford
	2	Truck	1½ ton	Co. Business	Ford
	2	Truck	1½ ton	Co. Business	International Harvester
	1	Truck	.....	Co. Business	International Harvester
	1	Truck	¾ ton	Co. Business	International Harvester
	1	Truck	2 ton	Co. Business	International Harvester
Illinois Terminal	1	Bus	29	Rev.	Mack
Indiana	13	Bus	24	Rev.	White
	7	Bus	22	Rev.	Beaver Coach Company
International-Great Northern	1	Truck	.....	.....	General Motors
	2	Automobile	.....	.....	Ford
	2	Automobile	.....	.....	General Motors
	1	Automobile	.....	.....	Chrysler
Interstate	1	Automobile	2	Co. Business	Buick
Lake Superior & Ishpeming	1	Truck	1½ ton	Co. Business	Chevrolet
Maine Central					
Maine Central Transportation Company	3	Bus	18	Rev.	General Motors
	2	Bus	21	Rev.	General Motors
Minneapolis & St. Louis	1	Truck	2-3 ton	Rev.	International Harvester
Minneapolis, St. Paul & Sault Ste. Marie	1	Truck	½ ton	Co. Business	Ford
	2	Automobile	5	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Hudson
Mississippi Central	1	Automobile	.....	Co. Business	Dodge
Missouri-Kansas-Texas	1	Bus	22	Co. Business	Chevrolet
	1	Truck	1½ ton	Co. Business	International Harvester
	1	Truck	1 ton	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Oldsmobile
	1	Automobile	5	Co. Business	Chevrolet
Missouri Pacific	1	Truck	.....	Co. Business	Chevrolet
	1	Truck	1½-2 ton	Co. Business	General Motors
	1	Truck	1½ ton	Co. Business	General Motors
	1	Truck	1½-2 ton	Co. Business	International Harvester
	1	Truck	1½ ton	Co. Business	Chevrolet
	22	Automobile	5	Co. Business	Chevrolet
	3	Automobile	5	Co. Business	Ford
	1	Automobile	2	Co. Business	Chevrolet
Monongahela	1	Truck	1½ ton	Co. Business	Ford
New York Central	13	Truck	1½ ton	Co. Business	.....
	6	Truck	½ ton	Co. Business	.....
	2	Truck	2 ton	Co. Business	.....
	2	Truck	3 ton	Co. Business	.....
	2	Truck	.....	Co. Business	.....
	1	Truck	7½ ton	Co. Business	.....
Central Greyhound Lines	60	Bus	36	Rev.	General Motors
	3	Automobile	2	Co. Business	Ford
New York, Chicago & St. Louis	1	Truck	1 ton	Co. Business	Ford
	1	Automobile	5	Co. Business	Chevrolet
New York, New Haven & Hartford	22	Truck	3 ton	Co. Business	Ford
	15	Truck	¾ ton	Co. Business	Ford
	3	Truck	½ ton	Co. Business	Ford
	3	Automobile	5	Co. Business	Ford
	1	Automobile	5	Co. Business	Ford
Connecticut Company	31	Bus	30	Rev.	General Motors
	10	Bus	35	Rev.	A.C.F. Motors
	8	Bus	30	Rev.	A.C.F. Motors
	5	Bus	30	Rev.	Mack
	5	Bus	23	Rev.	Twin Coach
	2	Truck	3 ton	Co. Business	Ford
New England Transportation Company	5	Bus	25	Rev.	General Motors
	5	Bus	27	Rev.	General Motors
	1	Bus	23	Rev.	General Motors
	2	Trailer	5 ton	Rev.	Martin Rocking Fifth Wheel Co.
	1	Automobile	2	Co. Business	Ford
	1	Automobile	5	Co. Business	Ford
	1	Automobile	2	Co. Business	Plymouth
	1	Automobile	2	Co. Business	Chevrolet
Berkshire Street Railway	6	Bus	21	Rev.	General Motors
	5	Bus	23	Rev.	Twin Coach
	3	Bus	27	Rev.	General Motors
County Transportation Company	7	Bus	20	Rev.	Ford
	5	Bus	21	Rev.	General Motors
Springfield (Mass.) Street Railway	5	Bus	30	Rev.	General Motors
	4	Bus	32	Rev.	Mack
	1	Automobile	2	Co. Business	Ford
Norfolk & Western	1	Truck	¾ ton	Co. Business	Ford
	1	Truck	1½-4 ton	Co. Business	International Harvester
	2	Truck	1½ ton	Co. Business	Chevrolet
Northern Pacific	3	Truck	7 ton	Rev.	Kenworth
	1	Truck	1½ ton	Rev.	Chevrolet
	1	Truck	1½ ton	Rev.	Ford
	1	Trailer	3 ton	Rev.	Fruehauf
	1	Automobile	5	Co. Business	Chevrolet
Northwestern Improvement Company	2	Truck	2½ ton	Co. Business	Mack
	2	Truck	1½ ton	Co. Business	Ford
	1	Automobile	5	Co. Business	Chevrolet
	1	Automobile	5	Co. Business	Plymouth
Northern Pacific Transport Company	3	Truck	7 ton	Rev.	Kenworth
	1	Truck	1½ ton	Rev.	Chevrolet
	1	Truck	1½ ton	Rev.	Ford
	4	Trailer	3 ton	Rev.	Fruehauf
Yellowstone Park Company	41	Bus	14	Rev.	White
	3	Automobile	7	Rev.	General Motors
Northwestern Pacific	1	Automobile	5	Co. Business	.....
Pennsylvania	11	Truck	1½ ton	.....	.....
	4	Truck	.....	.....	.....
	3	Truck	5 ton	.....	.....
	2	Truck	4 ton	.....	.....
	1	Truck	½ ton	.....	.....
	1	Truck	2 ton	.....	.....
	1	Truck	2½ ton	.....	.....
	1	Truck	3 ton	.....	.....
	1	Truck	7 ton	.....	.....
	1	Truck	2 ton	.....	.....
	5	Tractor	.....	.....	.....
	6	Automobile	5	.....	.....
Pennsylvania Greyhound Lines	60	Bus	37	Rev.	General Motors
	1	Truck	.....	Co. Business	Ford
	2	Automobile	2	Co. Business	Ford

(*Continued on next left-hand page*)

Passenger Power

Boston & Maine R. R.



Southern Pacific Company

Freight Power

Kansas City Southern Ry.

Pere Marquette Ry.

Switching Power

Bauxite & Northern Ry.

New York Central System

Chicago & Illinois Midland Ry.

Youngstown & Northern R. R.

Newburgh & South Shore Ry.

1937 Lima Built Power

LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

Purchaser	No.	Type of vehicle	Seating capacity or truck capacity in tons	Where to be used	Manufacturer
Pennsylvania Trucking Affiliates	132	Truck	Less than 3 ton	.....	.....
	23	Truck	3-5 ton	.....	.....
	34	Tractor	.....	.....	.....
	92	Trailer	.....	.....	.....
Pennsylvania-Reading Seashore Lines	5	Bus	32	Rev.	General Motors
	2	Truck	1½ ton	Co. Business	Ford
	1	Automobile	6	Co. Business	Ford
	1	Automobile	2	Co. Business	Plymouth
	1	Automobile	5	Co. Business	Buick
Pere Marquette	2	Truck	1½ ton	Co. Business	Ford
	1	Truck	1½ ton	Co. Business	International Harvester
	1	Truck	2 ton	Co. Business	General Motors
Railway Express Agency	859	Truck	.....	.....	.....
	27	Tractor	.....	.....	.....
	63	Trailer	.....	.....	.....
Sacramento Northern	3	Bus	28	Rev.	A.C.F. Motors
	1	Bus	36	Rev.	A.C.F. Motors
St. Louis Southwestern					
Southwestern Transportation Company	1	Automobile	5	Co. Business	Packard
Southwestern Greyhound Lines	30	Bus	36	Rev.	General Motors
Seaboard Air Line	1	Truck	2-3 ton	Co. Business	White
	4	Tractor	.....	Rev.	Reo
	1	Tractor	.....	Rev.	International Harvester
	1	Tractor	.....	Rev.	Mack
	1	Tractor	.....	Rev.	General Motors
	4	Trailer	4 ton	Rev.	Reo
	1	Trailer	1½ ton	Rev.	International Harvester
	1	Trailer	1½ ton	Rev.	Mack
	1	Trailer	6 ton	Rev.	General Motors
	18	Automobile	.....	Co. Business	Chevrolet
	6	Automobile	.....	Co. Business	Ford
	4	Automobile	.....	Co. Business	Plymouth
	1	Automobile	.....	Co. Business	Pontiac
Southern					
Yadkin Coach Company	2	Bus	21	Rev.	Chevrolet
Southern Pacific	41	Truck	1½ ton	Rev.	.....
	7	Truck	1½ ton	Co. Business	.....
	6	Truck	.....	Co. Business	.....
	3	Truck	½ ton	Co. Business	.....
	3	Truck	5 ton	Rev.	.....
	2	Truck	2½ ton	Rev.	.....
	2	Truck	2½ ton	Co. Business	.....
	2	Truck	3½ ton	Rev.	.....
	1	Truck	.....	Rev.	.....
	1	Truck	½ ton	Rev.	.....
	1	Truck	2 ton	Rev.	.....
	1	Truck	2 ton	Co. Business	.....
	1	Tractor	3 ton	Rev.	.....
	10	Automobile	5	Co. Business	.....
	1	Automobile	5	Co. Business	.....
Pacific Greyhound Lines	160	Bus	37	Rev.	General Motors
	4	Bus	21	Rev.	General Motors
Pacific Motor Trucking Company	21	Truck	1½ ton	Rev.	Chevrolet
	8	Truck	1½ ton	Rev.	General Motors
	6	Truck	1½ ton	Rev.	Ford
	6	Truck	1½ ton	Rev.	International Harvester
	3	Truck	4-5 ton	Rev.	International Harvester
	3	Truck	1½ ton	Rev.	Dodge
	2	Truck	3-5 ton	Rev.	General Motors
	1	Truck	3-5 ton	Rev.	Dodge
	1	Truck	½ ton	Co. Business	Chevrolet
	1	Truck	1 ton	Co. Business	Chevrolet
	1	Tractor	5 ton	Rev.	General Motors
	1	Tractor	5 ton	Rev.	White
	1	Tractor	5-6 ton	Rev.	Fageol
	1	Tractor	3 ton	Rev.	International Harvester
Spokane, Portland & Seattle					
Spokane, Portland & Seattle Transportation Company	3	Bus	25	Rev.	White
Texas & New Orleans	1	Bus	21	Co. Business	General Motors
	1	Truck	1½ ton	Co. Business	Dodge
	1	Automobile	4	Co. Business	Ford
	1	Automobile	2	Co. Business	Chevrolet
Southern Pacific Transport Company	3	Truck	1½ ton	Co. Business	Chevrolet
	2	Truck	1½ ton	Co. Business	International Harvester
	2	Truck	1½ ton	Co. Business	Ford
	1	Truck	1½ ton	Co. Business	Dodge
	1	Automobile	2	Co. Business	Plymouth
Toledo Terminal	2	Automobile	5	Co. Business	Chrysler
Union Pacific	55	Bus	36	Rev.	.....
	12	Bus	14	Rev.	.....
	3	Bus	25	Rev.	.....
	3	Bus	7	Rev.	.....
	11	Truck	1½ ton	Co. Business	.....
	2	Truck	2 ton	Co. Business	.....
	1	Truck	¾ ton	Rev.	.....
	12	Trailer	.....	Rev.	.....
	4	Automobile	5	Co. Business	.....
	1	Automobile	2	Co. Business	.....
Union Pacific Stages, Inc.	27	Bus	37	Rev.	General Motors
Interstate Transit Lines	73	Bus	37	Rev.	General Motors
Virginian	1	Bus	.....	Co. Business	Ford
	1	Truck	1½ ton	Co. Business	Ford
	2	Automobile	5	Co. Business	Ford
	1	Automobile	5	Co. Business	Chevrolet
Waterloo, Cedar Falls & Northern	3	Bus	27	Rev.	Dittmar Manufacturing Company
	3	Bus	21	Rev.	General Motors
	2	Bus	25	Rev.	Dittmar Manufacturing Company
	2	Bus	40	Rev.	Dittmar Manufacturing Company
	1	Bus	21	Rev.	General Motors
	1	Truck	2½ ton	Co. Business	General Motors
	1	Truck	½ ton	Co. Business	Ford
	1	Truck	¾ ton	Co. Business	General Motors
	1	Automobile	.....	Co. Business	Buick
Wheeling & Lake Erie	1	Truck	1½ ton	Co. Business	Dodge
Canada					
British Columbia Electric Railway	10	Bus	29	Rev.	Kenworth
	10	Bus	29	Rev.	Assoc. Equip. Co. of Canada, Ltd.
	4	Bus	37	Rev.	Mack
	3	Bus	35	Rev.	Mack
Canadian Pacific					
Canadian Pacific Transport Company	1	Bus	23	Rev.	Twin Coach
	1	Bus	31	Rev.	Twin Coach
Quebec Central					
Quebec Central Transportation Company	1	Bus	27	Rev.	Canadian Yellow Cab Mfg. Co.

NEWS

I.C.C. Fixes New Railway Valuation

Data offered as an exhibit in Ex Parte 123 rate increase case

The Interstate Commerce Commission on December 23, announced that the cost of reproducing the railroads of the United States new, except land and rights, would be $26,238,856,914. This information was contained in a report prepared by the commission's Bureau of Valuation, which has been introduced as an exhibit in the 15 per cent rate increase case now pending before the commission. Other estimates prepared for the exhibit are as follows: for original cost less depreciation, except land and rights, $16,423,504,728; cost of reproduction less depreciation, except land and rights, $18,906,861,318; present value of land and rights, $2,606,869,985; and working capital, including materials and supplies on hand, $300,193,743.

The Bureau of Valuation also made a forecast of prices of rail materials in the near future, saying that the present "period price level will hold good for two or three years, and possibly longer, before it will be necessary to determine a new level of prices." The "period prices" used by the Bureau are defined as based on a consideration of yearly prices, and are "below present spot price levels." The Bureau believes that the present tendency of prices is downward.

The report went on to say that the "effect of projecting prices into the future has been to keep the bureau's period level below the present spot prices, as the bureau believes these spot prices do not represent a permanent level or trend on most items of railroad property."

Railroad Facilities in New York Praised by Merchant Group

Reference to the carriers' improvement of the transportation of goods and passengers in and out of New York was made by William H. Chandler, manager of the traffic bureau of the Merchants' Association of New York in a public statement released as part of a "Reveal New York" program. While the statement dealt with all the forms of transport found in the city, special praise was expressed for the warehouse and pick-up and delivery services which the carriers have introduced. As Mr. Chandler phrased it: "Railroads have built modern warehouses at their terminals, thereby eliminating the necessity for a trucking service when goods go directly to storage. Modern auction rooms and produce terminals have been constructed for the accommodation of the city produce dealers. Terminals have been established in Brooklyn, thus enabling shippers to make delivery to all trunk line roads at a common receiving station instead of having to cart their goods to Manhattan, and the Port Authority terminal, which is used by all railroads, marks an advance over 1897 that was not even thought of at that time."

Pointing out that in 1897, when the merchants' group was founded, there were five competing express companies, Mr. Chandler went on to say that today, when only one organization, owned by all the railroads, is in operation, "shippers are given better service and more considerate treatment than they received when there were five competitors for this business." The traffic expert also spoke of the establishment of store-door delivery throughout the city and off-rail freight stations in Bronx borough which, he declared, further eased the shipper's problems.

Dunn to Address Canadian Railway Club

The Canadian Railway Club will hold its annual meeting on January 10 at the Windsor hotel, Montreal, Que. Samuel O. Dunn, editor of *Railway Age* and chairman of the board of Simmons-Boardman Publishing Corporation, will deliver the main address. His topic will be "Railroads and the National Welfare".

Atlantic States Advisory Board to Meet January 26-27

The Atlantic States Shippers Advisory Board will hold its 14th annual and 45th regular meeting on January 26 and 27 at the Warwick hotel, Philadelphia, Pa. The first day meeting will be devoted to the subject of freight loss and damage prevention. The second day will be devoted to a discussion of the carloadings forecast for the first quarter of 1938 and to other general topics, which will be announced at a later date.

Mid-West Board Meeting

The forty-fourth regular and fourteenth annual meeting of the Mid-West Shippers' Advisory Board will be held at the Palmer House, Chicago, on January 6. At a luncheon to be given under the joint auspices of the Mid-West Shippers' Advisory Board and the Public Affairs Committee of the Traffic Club of Chicago, addresses will be made by Phil S. Hanna, editor, The Chicago Journal of Commerce and J. E. Bryan, who has been general chairman of the board for the past four years.

Wheeler Planning Rail Legislation

Will confer with representatives of management, labor and government

Senator Wheeler, of Montana, chairman of the Senate Committee on Interstate Commerce, announced on December 24 that immediately after Congress convenes he would begin conferences with government officials, railway executives and representatives of investors in railway securities preparatory to the introduction of railway legislation of major importance. Senator Wheeler asserted that "the railroads of the United States are very sick and need immediate attention, not only in their own interest but also in the interest of the public, investors and labor. I expect within the very near future to confer with the President, with Jesse Jones and other members of the Reconstruction Finance Corporation, with members of the Interstate Commerce Commission and spokesmen for the railroads, labor and industry generally."

Senator Wheeler went on to say that he would introduce whatever legislation was necessary to ease the national railroad situation, and added that he hoped he could do this before the next session was very far along. "Unless we can do something for the railroads," the Senator said, "I believe several more of them will go into receivership in the not far-off future. The problem cannot, in my opinion, be solved by increasing rates alone. We must consider that proposition in the light of what higher rates would do to the traffic volume. There can be no question that a situation exists which demands the attention of Congress and the administration. It is only necessary to note that the first 14 railroads to report their November income to the Interstate Commerce Commission disclosed an average net operating income 46.3 per cent less than for November, 1936."

Senator Wheeler's subcommittee investigating railroad finance will resume hearings on January 4, with the Pennsylvania as the road under scrutiny.

New East-Minneapolis Car Service Saves 24 Hours

A daily through merchandise car service connecting New York and the Atlantic seaboard territory with Minneapolis, Minn., and the northwest, effecting a saving of 24 hours from present schedules, has been inaugurated by the Minneapolis & St.

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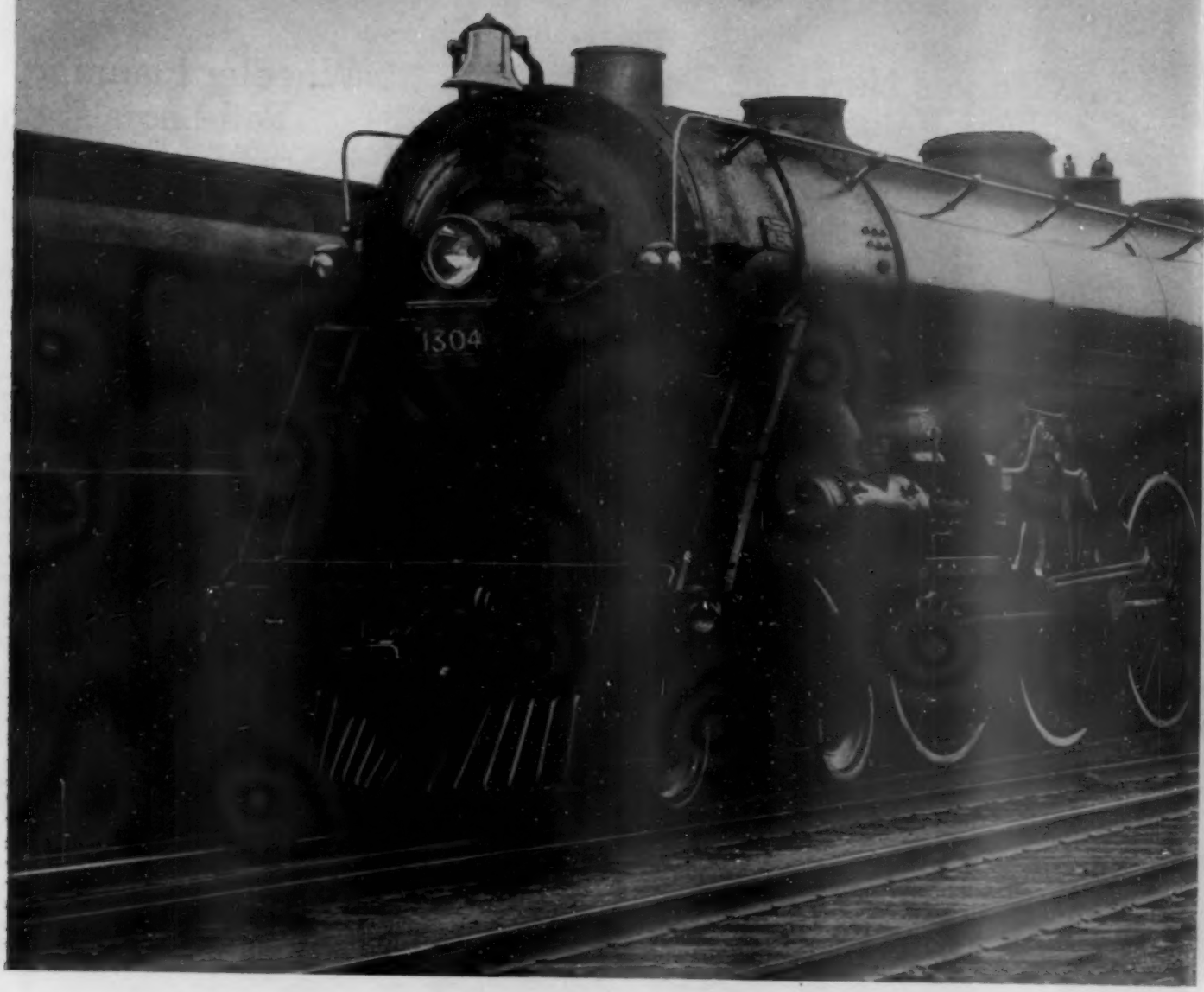
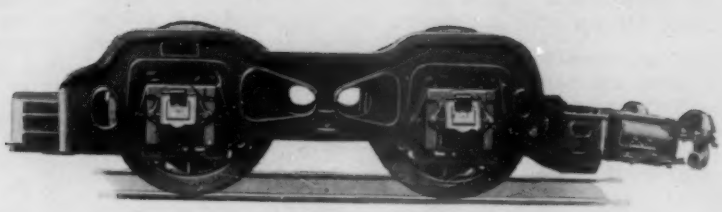
MODERN POWER . . .





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FRANKLIN RAILWAY

NEW YORK

IS BALANCED POWER

The trend of Modern Locomotive design is definitely towards minimum weight on drivers, reduced dynamic augment, high starting and accelerating power, and high horsepower capacity at high road speeds.

To meet these objectives, the high horsepower required in the operating range of speed is provided by the main cylinders and the additional tractive effort required for starting and rapid acceleration to road speeds is provided by the Booster.

Such a locomotive, operating at the high speeds and high capacities of modern railroading, insures lower track maintenance costs, increased economies of operation and maintenance and greater net returns from every train it hauls.

SUPPLY COMPANY, INC.

CHICAGO MONTREAL

Louis in connection with steamship lines entering Norfolk, Va., and the Norfolk & Western, the Illinois Central and the Big Four. A through rail-water rate published to cover the service offers a differential from standard all-rail tariffs.

Shipments are transported to Norfolk from New York by the Eastern Steamship Company; from Philadelphia, Pa., by the Philadelphia & Norfolk Steamship Company; from Boston, Mass., and Providence, R. I., by the Merchants and Miners Transportation Company; and from Baltimore, Md., by the Baltimore Steam Packet & Chesapeake Steamship company. Less-than-carload freight arriving at Norfolk via these lines is consolidated into a daily through car and started on its westward journey by the Norfolk & Western at 11:30 p. m. the same night. Further routing consists of the Big Four and the Illinois Central to Albert Lea, Minn., with fourth morning arrival at Minneapolis via the Minneapolis & St. Louis. Here connections are made for further shipment to the northwest.

Boulder Derails Pennsylvania Train

The engineman and fireman of the second section of eastbound Gotham Limited of the Pennsylvania were killed when the locomotive left the rails at Elliott, Pa., about four miles west of Pittsburgh, at 8:23 a.m., December 25, and plunged down a 60 to 70-ft. embankment to the street below. The train carried no revenue passengers, but a crew dead-heading on a diner sustained minor injuries. Officers of the road have adjudged that the wreck was caused by a boulder about the size of a bushel basket, which fell from the side of a hill immediately above the tracks.

Enthusiast Activities

The next meeting of the Philadelphia division, Railroad Enthusiasts, Inc., will be held on January 14 at the Baltimore & Ohio ticket office, Broad and Walnut streets, Philadelphia, Pa.

The New York division, Railroad Enthusiasts, Inc., and the New York chapter, Railway & Locomotive Historical Society will hold their first joint meeting on January 11 in the railroad branch of Y. M. C. A., 224 East 47th street, New York. At that time W. T. Gaynor, assistant advertising manager, New York Central, and a member of both societies, will speak on "The Effect of the Fan Movement from the Railroad Viewpoint." The program will also include a series of moving pictures taken on various enthusiasts' railroad trips.

November Truck Loadings 16.94 Per Cent Under October

The volume of freight moved by truck in November was 9.72 per cent under the volume handled in the corresponding month of last year, and 16.94 per cent under the October tonnage, according to the monthly statistics of truck loadings issued by the American Trucking Associations, Inc. The figures are based on comparable reports received from 135 motor carriers in 31 states, showing an aggregate volume of 380,723 tons carried in November, compared with 458,371 tons in October and 421,688 tons in November, 1936.

In general, seasonal declines, labor unrest and the drop in business activity were given as reasons for the decrease in the freight volume by many of the reporting carriers. The ATA truck loadings index figure based on the 1936 monthly average as 100, for November stood at 92.89 as compared with 122.8 in October.

"While considered representative of a fair cross-section of the industry," says the ATA, "total volume reported should not be taken as indicating the total volume of freight being transported by truck. It is the design of the compilation to show the trend in truck loadings, rather than actual tonnage hauled."

Club Meetings

The Toronto Railway Club will hold its next meeting at the Royal York hotel, Toronto, on January 24. W. J. McGarry, manager of open car section, Car Service division, Association of American Railroads, will present a paper entitled: "The Car Service Division, Asscciation of American Railroads — Its History and Functions."

The Car Foremen's Association of Chicago will hold its next meeting on January 10 at 8:00 p. m. at the La Salle hotel, Chicago. J. E. Mehan, assistant to superintendent car department, Chicago, Milwaukee, St. Paul & Pacific, will present a paper entitled "Discussion of A.A.R. Rules of Interchange—1938 Code".

The Southern and Southwestern Railway Club will hold its next meeting on January 20 at the Ansley hotel, Atlanta, Ga. A paper entitled "Brake Shoes" will be presented by M. N. Trainer, vice-president, American Brake Shoe & Foundry. J. C. McCune, Westinghouse Air Brake Company, will present a paper entitled "Air Brakes".

Splawn New Chairman of I.C.C.

Pursuant to the policy adopted January 13, 1911, Commissioner Walter M. W. Splawn has been elected Chairman of the Interstate Commerce Commission, effective January 1, 1938, for the ensuing year. He succeeds the present Chairman, Commissioner Carroll Miller.

Commissioner Splawn, at one time a member of the Railroad Commission of Texas, was nominated by President Roosevelt on January 8, 1934, to be a member of the Interstate Commerce Commission. He took the oath of office on February 1, 1934. The new Chairman received his early education in Texas, and then took the bachelor's and master's degrees at Yale University and the Ph.D. at the University of Chicago. He was admitted to the Texas Bar in 1909. From 1912 to 1915 he practiced law at Fort Worth, Texas. Later he became Professor of Economics at the University of Texas and then President of that University.

Commissioner Splawn came to Washington to participate as referee in the arbitration of claims for ships seized during the World War. Afterwards he served as Special Counsel for the Committee on Interstate and Foreign Commerce of the House of Representatives. He is the author of books entitled the "Consolidation of Railroads" and "Government Ownership and Operation of Railroads."

Freight Car Loading

Loading of revenue freight for the week ended December 18 totaled 603,292 cars, a decrease of 18,839 cars or three per cent below the preceding week, a decrease of 126,756 cars or 17.4 per cent below the corresponding week in 1936, and a decrease of 110,573 cars or 15.5 per cent below the same week in 1930. All commodity classifications except grain and grain products showed decreases under the preceding week and under last year. The summary, as compiled by the Car Service Division, Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, December 18

Districts	1937	1936	1935
Eastern	129,669	163,322	134,984
Allegheny	105,596	148,602	114,348
Pocahontas	44,168	53,954	43,672
Southern	96,949	107,934	91,599
Northwestern	73,254	83,366	69,985
Central Western	99,104	111,521	91,479
Southwestern	54,552	61,349	54,599
Total Western Districts	226,910	256,236	216,063
Total All Roads	603,292	730,048	600,666
Commodities			
Grain and Grain Products	35,620	33,807	29,024
Live Stock	14,363	14,767	12,081
Coal	149,929	162,441	134,405
Coke	6,431	11,201	7,900
Forest Products	25,106	35,738	29,586
Ore	8,492	9,198	7,443
Merchandise l.c.l.	145,648	164,415	151,251
Miscellaneous	217,703	298,481	228,976
December 18	603,292	730,048	600,666
December 11	622,131	739,096	616,650
December 4	623,337	745,295	638,518
November 27	558,627	680,300	571,878
November 20	647,251	789,772	647,924
Cumulative Total, 51 Weeks	37,532,561	35,500,097	31,037,446

In Canada.—Car loadings for the week ended December 18 totaled 47,691 cars, an increase over the previous week's loadings of 504 and a decrease of 2,019 under 1936, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
Dec. 18, 1937	47,691	25,204
Dec. 11, 1937	47,187	23,517
Dec. 4, 1937	50,568	25,197
Dec. 12, 1936	49,710	29,605
Cumulative Totals for Canada:		
Dec. 18, 1937	2,552,293	1,326,581
Dec. 12, 1936	2,393,969	1,183,182
Dec. 14, 1935	2,279,497	1,070,446

59,402 See "City of Los Angeles" at New York and 17,729 at Chicago

A total of 17,729 persons passed through the streamliner, the "City of Los Angeles," of the Union Pacific-Chicago & North Western, when it was exhibited in the latter's passenger station in Chicago on December 15.

Between 8 a. m. and 10 p. m. on December 18, 19,402 New Yorkers passed through the quarter-mile length of the new 17-car streamliner "City of Los Angeles," which was recently delivered to the Union Pacific

Continued on next left-hand page

NO. 47 OF A SERIES OF FAMOUS ARCHES OF THE WORLD

LANDWASSER VIADUCT, SWITZERLAND

The Landwasser Viaduct, on the Rhaetian Railway, Switzerland, is one of the most unique railway viaducts, being built on a curve of 328 feet radius. Another unusual feature is that the viaduct springs from a precipice, at which point the railroad enters a tunnel. » » » Each of its six arches spans a distance of 60 feet; the total length of the viaduct is 426 feet. The Landwasser Viaduct carries the main-line of the Rhaetian Railway from Coire to St. Moritz and the Engadine Valley.

* * *

The Security Sectional Brick Arch for the Locomotive firebox is the first major step in reducing fuel costs. It has had an important influence in the improved design of the modern locomotive firebox and is essential to the successful operation of larger modern power.

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED
60 EAST 42nd STREET, NEW YORK, N. Y.
Locomotive Combustion Specialists

and the Chicago & North Western for service between Los Angeles, Cal., and Chicago, when the train was placed on exhibition in Grand Central terminal, New York. An additional 40,000 persons viewed the new transportation unit from adjoining station platforms. So great was the press of interested people that during part of the day a multiple line of visitors laden with Christmas bundles extended from the train on track No. 36 to the information booth located in the center of the main station concourse, waiting to see the train.

At 2:30 p. m. the next day, the City of Los Angeles was towed through the Park Avenue tunnel by electric power and set out on a special run to Sun Valley, Idaho, site of the Union Pacific's winter sports center. All Pullman accommodations were sold out.

The train will go into regular service on December 27, when it will leave Los Angeles for Chicago.

Steam Railway Accident Statistics

The Interstate Commerce Commission's completed statistics of steam railway accidents for the month of September, 1937, now in preparation for the printer, will show:

Item	Month of September		9 months ended with September	
	1937	1936	1937	1936
Number of train accidents	579	605	6,465	6,099
Number of casualties in train, train-service and non-train accidents:				
Trespassers:				
Killed	240	267	2,055	2,110
Injured	213	259	2,095	2,165
Passengers on trains:				
(a) In train accidents*				
Killed	....	....	....	6
Injured	26	50	362	547
(b) In train-service accidents:				
Killed	2	2	10	6
Injured	172	153	1,486	1,299
Travelers not on trains:				
Killed	2	....	10	11
Injured	62	51	575	568
Employees on duty:				
Killed	48	45	507	473
Injured	1,980	1,836	18,461	16,002
All other nontrespassers:†				
Killed	192	139	1,461	1,276
Injured	617	557	5,042	4,725
Total—All classes of persons:				
Killed	484	453	4,043	3,882
Injured	3,070	2,906	28,021	25,306

* Train accidents are distinguished from train-service accidents by the fact that the former cause damage of more than $150 to railway property.

† Casualties to "Other nontrespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties *for all classes of persons, including both trespassers and nontrespassers,* were as follows:

Number of accidents	361	320	3,094	2,803
Persons:				
Killed	161	113	1,305	1,140
Injured	422	383	3,512	3,266

B. & M. Dubs New Year's Owl Service "Safe Whoopee" Trains

"Safe Whoopee" trains leaving North station, Boston, Mass., at 2 a. m., New Year's day morning, were operated by the Boston & Maine to 25 destinations in Massachusetts and New Hampshire. Advertised as a truly safe way of "navigating"

Don't Shend New Year's in The Hoose-Gow"
ON NEW YEAR'S EVE leave your automobile at home and make it a real HAPPY NEW YEAR for yourself and Registrar Frank Goodwin by using our
SAFE WHOOPEE TRAINS
from the NORTH STATION
at 2.00 A. M. NEW YEAR'S MORNING
To HAVERHILL — To ROCKPORT — To NASHUA

This Boston & Maine Hand-Bill Gives the Key Argument for "Sticking to Trains" on New Year's Eve

homeward after New Year's Eve festivities, the station pamphlets announcing the service urged that celebrants "make it a real happy New Year for yourself and Registrar Frank Goodwin." Headed by a cartoon depicting a somewhat inebriated gentleman in evening dress behind cell bars, and captioned "Don't spent New Year's in the 'hoose-gow'," the announcement implied that party-goers who cannot avoid traffic violations after a night of "cheer" should welcome the safety of railroad "owl" service.

Hearings Held on Through Routes Bill

A hearing was held before a subcommittee of the House committee on interstate and foreign commerce headed by Representative Maloney of Louisiana on December 16 and 17 on S. 1261, a bill amending paragraphs 3 and 4 of section 15 of the interstate commerce act with respect to the power of the commission over through routes and joint rates. The bill was passed last session by the Senate.

"The purpose of this bill", asserted C. A. Miller, general counsel of the American Short Line Railroad Association, principal proponent of the bill, "is to permit the Interstate Commerce Commission, when found to be in the public interest, to require a through route to be established or maintained, even though it may result in the short hauling of a carrier. The necessity for this legislation comes about by reason of the decision of the United States Supreme Court in the so-called Subiaco Routing Case, United States vs. Missouri Pacific, 278 U. S. 269. Prior to 1929 (when the Subiaco case was decided) the commission interpreted the provisions of the paragraph (4) of section 15 of the interstate commerce act as protecting the long hauls of originating carriers, or of subsequent carriers after obtaining possession of the traffic. . . . In the Subiaco case the United States Supreme Court held that the commission had been wrong in its interpretation of the act, and that it could not require a through route to be established which would short haul any carrier. The railroads have no constitutional right to a "long haul". Their present right is given them by statute. Congress gave it to them, and Congress can take it away."

Commissioner Eastman also appeared in support of the bill. Others appearing in support of the measure included J. M. Hood, president of the American Short Line Railroad Association; C. D. Cass, of the American Transit Association; D. A. Stickle, president of D. A. Stickle & Sons, of Hagerstown, Md.; J. J. King, general freight agent of the Akron, Canton & Youngstown; C. H. Sommer, president of the Quanah, Acme & Pacific; John E. Benton, for the state commissions, and E. F. Lacey, executive secretary of the National Industrial Traffic League.

Opponents of the bill will be given a hearing some time in January.

Union Pacific Bus Permit

The Interstate Commerce Commission, Division 5, has found that Union Pacific Stages is entitled to continue operation as a common carrier by motor vehicle of passengers, baggage, express and newspapers over specified routes, between Los Angeles, Calif., and a point on the California-Nevada State line east of Wheaton Springs, Calif., by reason of its "grandfather" rights.

St. Andrews Bay Line Gets Truck Permit

The Interstate Commerce Commission, Division 5, has granted the St. Andrews Bay Transportation Company, a subsidiary of the Atlanta & St. Andrews Bay, permission to operate as a common carrier by motor vehicle of general commodities, except explosives and inflammables, over a specified route between Dothan, Ala., and Columbus, Ga., 120 miles.

November Locomotive Shipments

November shipments of railroad locomotives from the country's principal manufacturing plants totaled 53 locomotives as compared with 14 in November, 1936, according to reports received by Bureau of Census, U. S. Department of Commerce. Included in last month's total were 33 steam locomotives and 13 Diesel-electrics for domestic service and seven steam locomotives for export. Unfilled orders at the end of November totaled 224 locomotives, including 127 steam, 26 electrics and 37 Diesel-electrics for domestic service and 34 steam for export.

For 1937's first 11 months shipments have totaled 463 locomotives as compared with 122 during the same period of 1936. The former total includes 325 steam locomotives and 125 Diesels for domestic service, and 12 steam and one Diesel for export.

Continued on next left-hand page

More Drawbar Horsepower

per unit of Weight and Cost
when locomotives are equipped with—

ELESCO TANGENTIAL STEAM DRYERS . . . *to dry the steam going to the superheater.*

ELESCO TYPE "E" SUPERHEATERS . . . *to provide steam with high degrees of superheat.*

ELESCO FEED WATER HEATING EQUIPMENT —the SINGLE STAGE INJECTOR TYPE or the CLOSED TYPE *with* ONE PUMP . . . *to preheat the feed water with exhaust steam which would otherwise be wasted.*

AMERICAN MULTIPLE-VALVE THROTTLES . . . *to provide superheated steam for the auxiliaries.*

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.
60 East 42nd Street, NEW YORK
122 S. Michigan Avenue, CHICAGO
Canada: THE SUPERHEATER CO., LTD.
MONTREAL

A-1197

Superheaters • Feed Water Heaters • Exhaust Steam Injectors • Superheated Steam Pyrometers • American Throttles • Tangential Steam Dryers

Supply Trade

Charles B. Collins, assistant vice-president of the **American Car & Foundry Co.,** at St. Louis, Mo., has resigned, effective January 1.

A. E. Biddle, vice-president of the **Cardwell-Westinghouse Company,** Chicago, has been elected executive vice-president, and **J. M. Hall,** chief engineer, has been elected vice-president.

The Watson-Stillman Company, Roselle, N. J., has transferred its district sales office from Columbus, Ohio, to Detroit, Mich. **J. C. Grindlay,** western sales manager, is in charge of the new office, which is located in the Book building.

G. M. Hogan has been appointed manufacturer's agent with offices at 320 South Michigan avenue, Chicago, to represent the **Sellers Manufacturing Company,** Chicago, the **Rails Company,** New Haven, Conn., and the **Centaur Tractor Corporation,** Greenwich, Ohio.

B. C. Wilkerson has been appointed service manager of **The Superheater Company** with headquarters at New York. During 1935 he was in charge of the New England territory and on January 1, 1936, was appointed chief service engineer, which position he has held until his recent appointment.

The Porcelain Enamel Sales Association has been organized by the O. Smith Johannsen Company, New York; the Peerless Equipment Company, Chicago; the Chandler Chemical Company, Cleveland, Ohio; the Hodson-Miller Corporation, Detroit, Mich., and the Public Service Supply Company, Inc., Cleveland, to extend the use of porcelain enamel into the basic industries. **L. J. Clay,** of the **Public Service Supply Company, Inc.,** has been elected president, and **W. H. Chandler,** of the **Chandler Chemical Company,** has been elected secretary.

N. S. McKay, chairman of the board of the **American Hair & Felt Company,** Chicago, has been elected president of the company, replacing Theodore Wilde. Mr. McKay will retain his positions as chairman and treasurer of the company. He was elected chairman of the board in January, 1937; **L. C. Scott** will continue as a vice-president of the company; **C. H. Rayner,** manager of the Dominion Hair Felt Company, Ltd., Canadian subsidiary, has been elected a vice-president; **J. C. Younglove** has been appointed general sales manager and will continue as manager of the company's transportation and government division.

Charles T. Ripley, former chief mechanical engineer of the Atchison, Topeka & Santa Fe, has been appointed chief engineer of the newly organized **Technical Board of the Wrought Steel Wheel Industry,** which has its office in the South Michigan building, Chicago. This organization was formed by the **American Rolling Mill Company,** the **Bethlehem Steel Company,** the **Carnegie-Illinois Steel Corporation,** the **Edgewater Steel Company** and the **Standard Steel Works Company.** The purpose of the board is to make an organized and co-ordinated attack on the technical problems presented by the increasingly difficult requirements of railroad service, to collect full information regarding the performance of wheels and to establish channels of communication and co-operation between the wrought steel wheel manufacturers and the railroads on engineering problems.

Charles E. Wilson, who has been elected to the new position of executive vice-president of the General Electric Company, with headquarters at New York, as has been announced in the *Railway Age* of December 25, was born in New York, and has been with the General Electric and one of its constituent companies, Sprague Electric, since 1899. Beginning as an office boy, he served in many branches of the business in various capacities, including shipping clerk, factory accountant, and production manager, before becoming assistant superintendent of the factory in 1914. Shortly thereafter, he was appointed sales manager, and in 1918, following the transfer of the conduit business from Sprague to General Electric, Mr. Wilson became assistant general superintendent of the Mazpeth and New Kensington works. In 1923 he was transferred to Bridgeport, Conn., as managing engineer in charge of the conduit and wire business, and two years later was appointed assistant manager of its Bridgeport works. In June, 1928, he was appointed assistant to the vice-president in charge of the merchandise department and two years later was appointed manager of that department in charge of engineering, manufacturing, and sales. In December of that year, Mr. Wilson was elected vice-president of the General Electric Company, and was one of the original members of the newly formed appliance sales committee of the company. In 1935 he was assigned additional responsibilities. Mr. Wilson is chairman of the board of the General Electric Contracts Corporation and other electric companies.

Charles E. Wilson

Philip D. Reed, who has been elected assistant to the president of the General Electric Company, with headquarters at New York, as was announced in the *Railway Age* of December 25, was born on November 16, 1889, at Milwaukee, Wisc., and was graduated from the University of Wisconsin with an electrical engineering degree in 1921, and three years later from Fordham University, with a doctor of laws degree. He first served as patent solicitor and later became patent attorney. He entered the General Electric's employ on November 15, 1926, as assistant to vice-president of the company's law department in New York. He was transferred in 1928 to the incandescent lamp department, and since July 1, 1934, has been general counsel of that department. Mr. Reed is a director of General Electric Contracts Corporation and also of a number of other electric companies.

Philip D. Reed

C. F. Hood, who has been elected president of the **American Steel & Wire Company,** the **Cyclone Fence Company** and the **Standard Fence Company,** subsidiaries of the **United States Steel Corporation,** to succeed **C. F. Blackmer,** resigned, was born in Monmouth, Ill., on February 8, 1894, and graduated from the University of Illinois in 1915. Mr. Hood's entire work since leaving college has been in the wire industry. He started first with the Packard Electric Company, Warren, Ohio, as sales engineer and assistant cable sales manager. In 1917 he entered the employ of the American Steel & Wire Company at Worcester, Mass., as an operating

C. F. Hood

clerk. With the exception of an interval from 1917 to 1919, when he was in the United States army, he has been with the wire company, holding such positions as foreman, assistant superintendent, superintendent, district manager and vice-president in charge of operations.

Mr. Blackmer was born on April 1, 1879, at Worcester, Mass., and graduated from Colorado College in 1897. After a short term of employment with the Colorado Trading and Transfer Company at Cripple Creek, Col., he became associated with the Washburn Moen Manufacturing Company, Waukegan, Ill., in 1898. Later this company was taken over by the American Steel & Wire Company. At Waukegan, Mr.

C. F. Blackmer

Blackmer was employed in various departments and rose to the position of assistant general superintendent. In 1920, he was transferred to Duluth as superintendent of the wire mills of the Minnesota Steel Company, also a subsidiary of the United States Steel Corporation. In 1925 he became district manager of the American Steel & Wire Company at Pittsburgh, which position he held until January, 1929, when he was transferred to Cleveland, Ohio, as general superintendent. In 1931, he was made vice-president in charge of operations, and in 1933 was elected president.

OBITUARY

W. W. Rosser, president of the Railway Truck Corporation, Chicago, died of pneumonia on December 22. He was born in Hutchinson, Minn., on November 4, 1877, and attended Hamline University. He entered the employ of the Northern Maleable Iron Company, St. Paul, Minn., in 1901 and served the Washburn Company, Chicago, from 1903 to 1905. He then entered the employ of the T. H. Symington Company and was vice-president of that company from 1915 to 1919. In the latter year he was elected vice-president of the Bradford Corporation, which position he held until 1930. In November, 1937, he became president of the Railway Truck Corporation.

TRADE PUBLICATIONS

RYERSON CERTIFIED STEELS.—Joseph T. Ryerson & Son, Inc., has issued a 28-page book on 11-in. by 50-in. sheets bound in stiff cardboard, for the purpose of setting forth its new method of marketing steels of specified physical and chemical properties. The significance of this special plan for furnishing steel of certified quality is explained in detail and the significant features are emphasized by a group of large and unusually attractive photographs. Several pages summarize the characteristics of some of the more important alloy steels as an aid in the selection of the most suitable types for various industrial purposes.

MANGANAL.—A 16-page catalogue has been issued by the Stulz-Sickles Company, Newark, N. J., which deals comprehensively with the line of nickel-manganese (Manganal) products, including bare and coated welding rods, applicator or filler bars, and forged wedges and wedge bars, manufactured by the company for the reclaiming or repairing units of manganese trackwork or machine or equipment parts. The catalogue not only describes the various products and their adaptability to a wide range of reclamation and repair work, but also includes many illustrations of their use. Reference is also made to the special hard-surfacing electrode, called Seaco, developed by the company for application over Manganal where an especially hard and wear-resisting surface is desired.

REFRIGERATION INSULATION.—The basic problems involved in insulation for all types of refrigerated and air-conditioned containers, including railroad passenger and refrigerator cars, are analyzed in a new 44-page booklet, "Fundamentals of Good Refrigerator Insulation," which has just been published by the Dry-Zero Corporation, Chicago. The booklet is a simple, concise explanation of the theory of insulation and its application to everyday refrigeration. While the subject matter is technical, the booklet has been written for the non-technical members of the refrigeration industry as well as its technical men.

The first section of the booklet deals with the manner in which insulating materials retard the passage of heat and explains why various insulating materials behave as they do under practical conditions. The second section discusses the influence of moisture, which is always present in refrigerator walls, how and why it affects the efficiency of insulations and how the dangers of moisture penetration can be minimized and even overcome, for practical purposes. The third section deals with some of the test results obtained by Dr. J. L. Finck at the U. S. Bureau of Standards, and the final portion of the booklet is devoted to a forecast of future developements in the field.

Construction

ELKHART & SANTA FE.—The Interstate Commerce Commission, Division 4, has extended from January 1, 1938, to January 1, 1940, the date for the completion by this company of a line of railroad in Cimarron County, Okla., and Union and Colfax Counties, N. M.

Equipment and Supplies

LOCOMOTIVES

THE NORFOLK SOUTHERN is inquiring for 5 locomotives of the 2-8-4 type.

IRON AND STEEL

THE MISSOURI PACIFIC has ordered 900 tons of rails from the Carnegie-Illinois Steel Corporation.

SIGNALING

PERE MARQUETTE.—The Lima Locomotive Works has placed an order with the General Railway Signal Company for 15 complete sets of intermittent inductive automanual train control engine equipments for Pere Marquette locomotives.

THE CHICAGO, BURLINGTON & QUINCY has placed an order with the General Railway Signal Company for a Type-H coded centralized traffic control installation at Hastings, Neb. The control machine, having 15 working levers and 27 track indications, will control 7 Model-5D switch machines, 30 Type-SA color-light signals and one switch lock.

THE NORTHERN PACIFIC has placed an order with the General Railway Signal Company for materials for a direct-current color-light automatic block signal installation with a-c. track circuits, between Whitehall, Mont., and Butte. Included in the order are 42 type-D color-light signals, 108 Type-K relays, 46 Type-W relays, 14 Type-K transformers, 2 Type-L transformers, 77 rectifiers, 38 switch circuit controllers and other incidental materials.

MOTOR VEHICLES

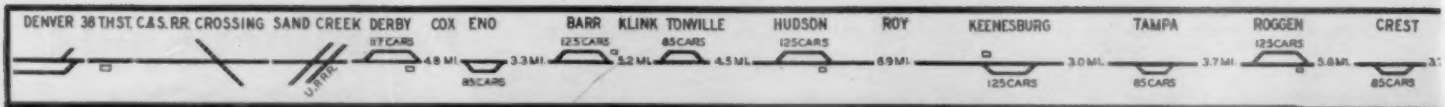
THE SANTA FE TRAIL TRANSPORTATION COMPANY has ordered from the American Car & Foundry Motors Company 45 buses of 36-passenger capacity, powered with Hall-Scott horizontal engines.

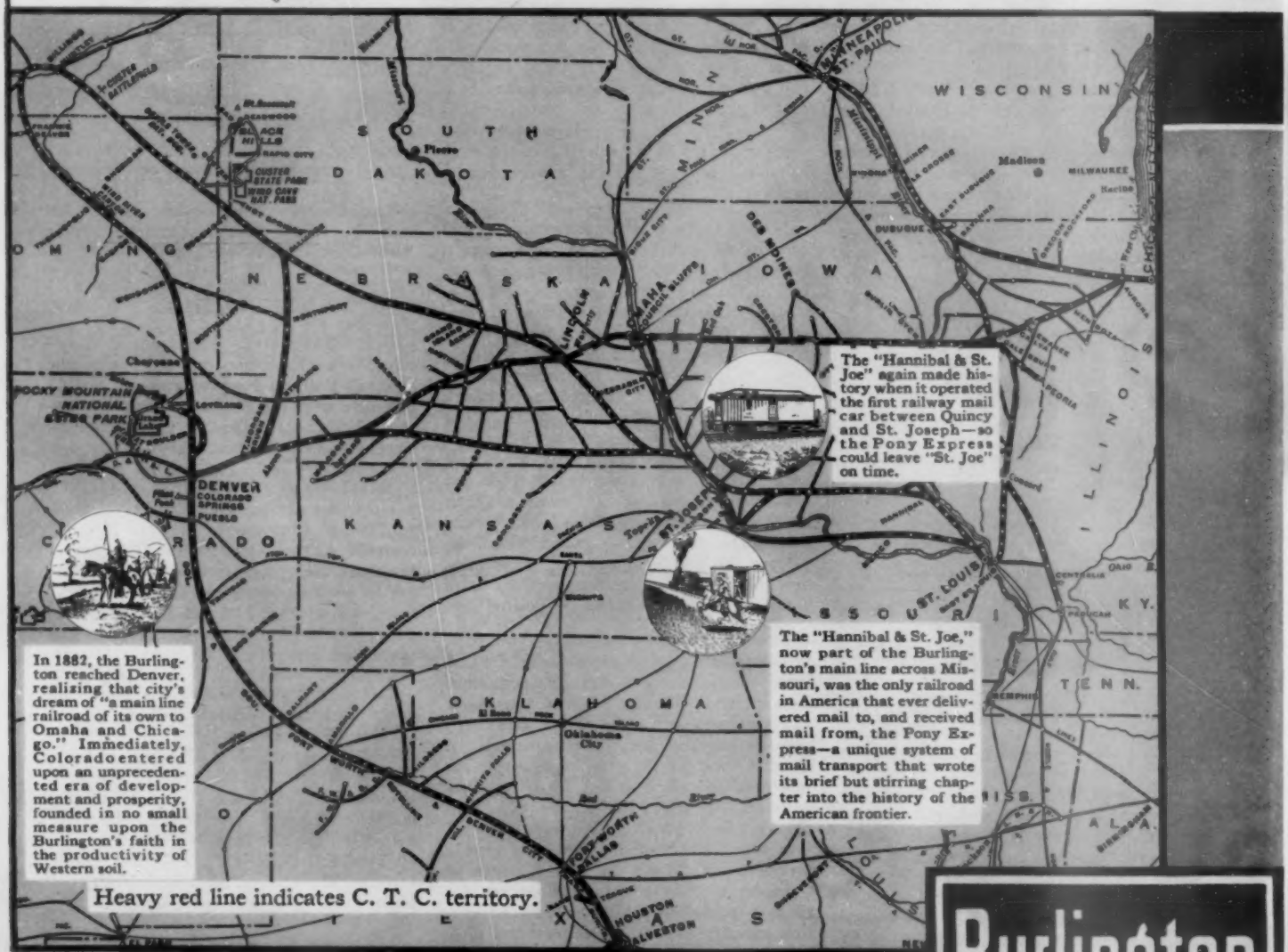
* * *

Photo by C. Parker

B. & M. Locomotive 3239 Hauling Four-Car Train Over Lynn (Mass.) Marshes

Continued on second left-hand page





In 1882, the Burlington reached Denver, realizing that city's dream of "a main line railroad of its own to Omaha and Chicago." Immediately, Colorado entered upon an unprecedented era of development and prosperity, founded in no small measure upon the Burlington's faith in the productivity of Western soil.

The "Hannibal & St. Joe" again made history when it operated the first railway mail car between Quincy and St. Joseph—so the Pony Express could leave "St. Joe" on time.

The "Hannibal & St. Joe," now part of the Burlington's main line across Missouri, was the only railroad in America that ever delivered mail to, and received mail from, the Pony Express—a unique system of mail transport that wrote its brief but stirring chapter into the history of the American frontier.

Heavy red line indicates C. T. C. territory.

The Burlington was the first railroad to install and operate high-speed, Diesel-powered, streamline trains in regular daily service. It now has eight of these history-making "Zephyrs" which run more than two million miles per year.

Burlington Route

1346

DISTRICT OFFICES

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

One of the new features of the control panel is a second track diagram showing the capacity of all passing sidings and the distance between sidings.

The Burlington Continues to Make History

WITH the inauguration, on December 7, 1937, of the longest stretch of Centralized Traffic Control yet installed, the Burlington again maintains its reputation for making history. With this installation in service, trains are operated by signal indication, without train orders and timetable superiority, over the entire sub-division from Denver to Akron, a distance of 112 miles.

This is not the first installation of this modern "Union" signaling system on the Burlington. At seven other shorter locations the excellent operating results secured in speeding up train service with increased safety for passengers and lading, at reduced costs, have justified this world's longest C.T.C. installation. » » » » »

With the aid of "Union" C.T.C., the Burlington is enabled to maintain its high speed "Zephyr" schedules and at the same time increase the speed of all trains. » » » » » » »

Whether one switch or an entire division is controlled, "Union" C.T.C. pays a return on the investment sufficient to quickly liquidate the installation cost. » » » » » »

Zephyr No. 1 at west end of Keenesburg

Dispatcher at C. T. C. Machine at Brush, Colorado

A non-stop meet at Bijou

Union Switch & Signal Co.
SWISSVALE, PA.

Financial

BALTIMORE & OHIO.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized this company to abandon the part of its Huff Run branch line extending from valuation station 192 plus 30 to the end of the line, approximately 1.5 mi. in Carroll County, Ohio.

BALTIMORE & OHIO.—*RFC Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of $8,233,000, which would mature on September 1, 1942. In its application the road states that $6,000,000 of the loan would be used for maintenance and the remainder to meet equipment trust maturities which will become due on February 1 and March 1 of next year.

CHICAGO & EASTERN ILLINOIS.—*Reorganization Plan.*—Finance Examiner Milo H. Brinkley, of the Interstate Commerce Commission, has submitted a proposed plan of reorganization for this company which he recommends the commission adopt. Under the plan the present common stockholders would be eliminated and the stock declared to have no value. Total capitalization under the proposed plan would not exceed $65,000,000, and the total fixed charges would be about $505,000.

CHICAGO, ROCK ISLAND & PACIFIC.—*Abandonment.*—The trustees have applied to the Interstate Commerce Commission for authority to abandon a line extending from Altamont, Mo., to Leavenworth, Kan., 69.04 miles.

DENVER & RIO GRANDE WESTERN.—*Trustees Certificates.*—The Interstate Commerce Commission has authorized trustees of this road to issue $1,800,000 of 4 per cent trustees certificates.

FONDA, JOHNSTOWN & GLOVERSVILLE.—*Trustee.*—The Interstate Commerce Commission has ratified appointment of Mal T. Montgomery as co-trustee of this road and has fixed his salary at $5,000 a year.

MINNEAPOLIS & ST. LOUIS.—*Receivers' Certificates.*—The Interstate Commerce Commission, Division 4, has modified its order of October 23 so as to limit the amount of receivers' certificates that may be issued under it by the receivers of this company to $604,350. The original order had authorized $805,800.

MISSOURI PACIFIC.—*Subsidiary reorganization.*—The federal district court at St. Louis has approved the petition of 16 subsidiary companies of the Missouri Pacific for corporate reorganization with their parent company, which now has reorganization proceedings pending in the federal court. Guy A. Thompson, trustee for the Missouri Pacific, was appointed to act as trustee for the subsidiaries.

SALT LAKE & UTAH.—*Sale.*—The entire property of this road extending 65.99 miles between Salt Lake City, Utah, and Payson, including a branch of 9.15 miles from Granger, Utah, to Magna, will be sold. The road is electrically operated and performs a general freight and passenger business. Its total trackage is 102.2 miles. Irwin Arnovitz has been appointed special master for the sale.

MONTANA WESTERN.—*Bond.*—The Interstate Commerce Commission, Division 4, has authorized this company to extend from January 1, 1932, to September 1, 1947, the maturity of a first mortgage 6 per cent gold bond in the amount of $165,000.

NELSON & ALBEMARLE.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to extend the maturity date of $100,000 of first mortgage bonds from January 1, 1938, to January 1, 1943, and to reduce the interest rate from six per cent to three per cent for that period.

NEVADA CENTRAL.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized this company to abandon its entire narrow-gage line from Battle Mountain, Nev., to Austin, 92.3 mi.

NEW YORK, NEW HAVEN & HARTFORD.—*Abandonment.*—Examiner Jerome K. Lyle of the Interstate Commerce Commission, in a proposed report to the commission, has recommended that it authorize the trustees to abandon a line extending from Hopkinton, Mass., to Ashland, 5.4 miles. Examiner Lyle also would have the commission deny the trustees the authority to abandon the line from Milford, Mass., to Hopkinton, 5.3 miles.

NEW YORK, NEW HAVEN & HARTFORD.—*Reorganization.*—The Interstate Commerce Commission, Division 4, has authorized Harry W. Harrison, Roy J. Brown, David W. McKnight, Joseph B. Russell and Wallace J. Falvey to serve as a protective committee for holders of the preferred stock of this company in its reorganization proceedings.

NORFOLK SOUTHERN.—*Acquisition by Norfolk Southern Bus Corporation.*—J. Edward Davey, chief of the section of finance of the Bureau of Motor Carriers of the Interstate Commerce Commission, in a proposed report to the commission, has recommended that the Norfolk Southern Bus Corporation be permitted to purchase the operating rights of the Virginia Dare Transportation Company.

NORFOLK & PORTSMOUTH BELT.—*Notes.*—This road has applied to the Interstate Commerce Commission for authority to issue $450,000 of 2½ per cent notes.

SOUTHERN.—*Stock.*—This road has applied to the Interstate Commerce Commission for authority to issue 1,298,000 shares of common stock without par value, to be exchanged share for share for its outstanding common stock, consisting of the same number of shares of a $100 par value.

SOUTHERN PACIFIC.—*Abandonment by Central Pacific.*—The Interstate Commerce Commission, Division 4, has authorized this company to abandon the operation and the Central Pacific to abandon the line extending from Tonopah Junction, Nev., to Benton, Calif., 50 miles.

Railway Officers

EXECUTIVE

W. A. Johnston, general traffic agent in charge of mail, baggage, express and merchandise traffic of the Illinois Central, has been promoted to assistant to the vice-president and general manager, with headquarters as before at Chicago, to succeed **Richard O. Fischer,** whose appointment as assistant general manager was reported in the *Railway Age* of December 25.

Emil Von Bergen, general airbrake, steam heat and lubrication engineer of the Illinois Central, has been appointed to the newly-created position of assistant to the vice-president and general manager—research, with headquarters as before at Chicago. In his new position, Mr. Von Bergen will make observations and studies with a view of accomplishing economies and improvements in the various phases of the company's operations.

C. B. Neubauer, auditor of the Southern, has been appointed assistant to vice-president, in charge of materials and supplies, with headquarters as before at Washington, D. C., succeeding **H. H. Laughton,** who has retired after 52 years service with this company.

Mr. Laughton was born at Richmond, Va., and after a public school education, entered railway service in October, 1885, as a messenger on the Richmond & Danville (now part of the Southern). Two years later he was appointed a clerk in the freight auditing department and in December, 1889, he became a clerk in the general auditor's office, later serving as a traveling auditor. In April, 1894, Mr. Laughton became chief clerk in the disbursing department, holding this position until January, 1901, when he was promoted to auditor of disbursements. Eight years later he was further promoted to auditor and in January, 1917, he was made assistant to the vice-president in charge of operation, with jurisdiction over materials and supplies, which position he held until his retirement. For many years Mr. Laughton was active in the affairs of the Railway Accounting Officers' Association (now merged with the A.A.R.) and at present is an honorary member of the accounting division of the association. He has also for many years taken an active part in the affairs of the Railway Store Keepers' Association and its successor, the Purchases and Stores division of the A. A. R.

Frank R. Newman, who has been appointed vice-president in charge of traffic of the Great Northern, with headquarters at St. Paul, Minn., as reported in the *Railway Age* of December 25, has served with various railroads continuously for 32 years. He was born on November 6, 1883, at Evanston, Ill., and attended Northwestern University. He first entered railway service with the Wabash in 1905, leaving this company in the following year to become a traveling freight agent with the

Continued on next left-hand page

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Michigan Central. After nine years in this capacity, Mr. Newman was advanced to assistant commercial agent and in 1917

Frank R. Newman

he became chief clerk to the traffic manager. In the following year he was promoted to assistant general freight agent, with headquarters at Buffalo, N. Y., and after two years in this capacity he was transferred to Detroit, Mich. In 1922, Mr. Newman left the Michigan Central to become general traffic manager of the Minneapolis, St. Paul & Sault Ste. Marie at Minneapolis, Minn. In 1925 he was made vice-president in charge of traffic of this company, which position he held until his recent appointment to the traffic vice-presidency of the Great Northern, effective January 1.

Harry H. Brown, vice-president in charge of traffic of the Great Northern with headquarters at St. Paul, Minn., whose retirement, effective January 1, because of ill health, was reported in the *Railway Age* of December 25, has been associated with the traffic department of the Great Northern at St. Paul for about 43 years. A native of Chicago, he was born on June 11, 1876, but soon moved to St. Paul, where he graduated from high school in 1893. Shortly thereafter he entered the general freight office of the

Harry H. Brown

Great Northern at that point as an office boy, advancing through the positions of correspondence clerk, mailing clerk, assistant traffic clerk, rate clerk, traffic clerk and chief clerk. In 1908, he was further advanced to assistant general freight agent and in 1916 he was appointed general freight agent. Two years later Mr. Brown was promoted to assistant traffic manager, which position he held until 1920, when he was appointed assistant freight traffic manager. Eight years later he was promoted to general traffic manager and late in 1931 he was further advanced to vice-president in charge of traffic.

Paul P. Hastings has been appointed vice-president in charge of traffic of the Atchison, Topeka & Santa Fe, effective March 1, 1938, to succeed **Fred B. Houghton,** who is retiring, as reported in the *Railway Age* of December 25.

Mr. Hastings was born on October 22, 1872, at Farmington, Kan., and entered the service of the Santa Fe in August, 1891, as a revising clerk at Topeka, Kan. In 1895 he joined the Santa Fe, Prescott & Phoenix (now part of the Santa Fe) as a rate clerk at Prescott, Ariz., and in 1898

Paul P. Hastings

he became traffic manager for a copper company at Jerome, Ariz. From 1900 to 1902, he served as auditor and general freight and passenger agent for the United Verde & Pacific (now abandoned) at Jerome, returning to the service of the S. F., P. & P. in 1903 as an auditor at Prescott. In 1907 he was advanced to general freight and passenger agent and in 1912 he returned to the Santa Fe as assistant general freight agent at San Francisco, Cal. During the World War, Mr. Hastings served with the United States Railroad Administration as assistant director of traffic at Washington, D. C. From 1920 to 1922 he was with the standing rate committee of the Transcontinental Freight Bureau at Chicago, then returning to the Santa Fe as general freight agent at San Francisco. In 1936 he was promoted to assistant freight traffic manager with the same headquarters and on May 1, 1937, he was further advanced to freight traffic manager, with headquarters at Chicago.

Mr. Houghton was born on November 6, 1866, and entered railway service in 1883 as a clerk and operator on the Toledo, Peoria & Western. In the following year he entered the service of the Santa Fe in the telegraph department, and later served successively in the accounting and traffic departments, becoming a clerk in the office

Fred B. Houghton

of the freight traffic manager at Chicago in 1891. Until 1897 he acted in this capacity and as chief clerk to the freight traffic manager, then being advanced to division freight and passenger agent at El Paso, Tex. In 1901 Mr. Houghton was promoted to assistant general freight agent, with headquarters at San Francisco, Cal., being further advanced to assistant freight traffic manager, with headquarters at Chicago, on March 1, 1905. On December 10, 1909, he was made freight traffic manager with the same headquarters, holding this position until July 1, 1927, when he became vice-president in charge of traffic.

FINANCIAL, LEGAL AND ACCOUNTING

T. Harold Cooper, assistant comptroller of the Canadian National system, with headquarters at Montreal, Que., has been appointed comptroller, succeeding **James Bower McLaren,** who has retired, after 45 years of service with the company. **Anthony C. Egan,** auditor of disbursements at Montreal, has been appointed assistant comptroller, and **William Smith Harrison,** auditor of revenues, has been

T. H. Cooper

appointed assistant comptroller. The above appointments are effective January 1.

Mr. Cooper began his railway career in the engineering department of the London,

Continued on next left-hand page

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You've done your Job
Here I come for
Lower Operating Costs
Replacement of those obsolete boring mills in your shops with cost cutting BULLARD Units offers one of the best paying investments for your road this year.
The savings effected generally average around 50% return on the investment. Certain installations have refunded as high as 62.5% in the first year's operation.
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Why not check up with your mechanical department?
THE BULLARD COMPANY
BRIDGEPORT, CONNECTICUT

Midland & Scottish (Great Britain). He went to Canada in 1912 as clerk in the accounting department of the Grand Trunk, later serving successively as auditor of disbursements, bookkeeper and chief bookkeeper. In 1918 Mr. Cooper was appointed assistant to the general auditor and the following year became assistant to the comptroller. He was loaned to the Canadian National in 1922 to assist in preparatory work pending the consolidation of the railways and in 1923 he was appointed assistant to the vice-president of finance of the C. N. R. From the latter year until 1929, Mr. Cooper served as general auditor, then becoming assistant comptroller, general accounts. In 1932 he was appointed auditor of general accounts, which position he held until August, 1936, when he became assistant comptroller. He now assumes the position of chief accounting officer for the Canadian National Railways and West Indies Steamships, including subsidiary companies in Canada and the United States.

J. B. McLaren

Mr. McLaren was born at Perth, Ont., on March 5, 1878, and began his railway career with the Grand Trunk as office boy at Brockville, Ont., in 1892, becoming a clerk there in 1897. In 1899 he was appointed export freight clerk at Durand, Mich., and in turn served as accountant, chief clerk, cashier and agent until 1901 when he was transferred to Montreal as clerk. He was appointed traveling auditor in 1905 and assistant chief clerk in 1907. In 1913 Mr. McLaren became auditor of freight accounts and in 1916 he was appointed auditor of revenues, which position he held until 1919 when he was advanced to general auditor. In February, 1923, Mr. McLaren was promoted to comptroller of the central region, with headquarters at Toronto, the position he held until June 1, 1930, when he became comptroller of the Canadian National system.

W. S. Harrison

Mr. Egan was born on October 6, 1883, at Winnipeg, Man., and entered railroad service in 1901 as an accountant at Winnipeg, with the Canadian Pacific. In August, 1904, he became a clerk in the audit department of roads now forming part of the Canadian National system. In 1908 he was advanced to assistant chief clerk, and shortly thereafter was appointed chief traveling auditor. In 1911, his jurisdiction was extended to include Toronto and he was assigned to the position of auditor of agencies. In January, 1919, he was promoted to assistant to the comptroller of the C. N. R. at Toronto, a position he held until December, 1920, when he became general auditor at Toronto. He served as comptroller, western region, at Winnipeg, from February, 1923, until his appointment as assistant comptroller of disbursements in June, 1930, becoming auditor of disbursements in 1932.

A. C. Egan

Mr. Harrison was born on April 3, 1879, and began his railway service in 1899 as a lampman with the Grand Trunk, at Mimico, Ont., later serving as agent at Strathroy, Ont., Mimico, Allandale, Collingwood, Lindsay and Campbellford until 1908 when he became traveling auditor. He served as assistant chief clerk and chief clerk in the audit office, Montreal, until 1918 when he became assistant to the auditor of revenues. In 1919 Mr. Harrison was appointed auditor of revenues and in 1923 he became general auditor of revenues for the Canadian National system. On June 1, 1930, he was appointed assistant comptroller of revenues, becoming auditor of revenues in 1932.

OPERATING

M. J. Welsh, superintendent of terminals on the Great Northern, with headquarters at Minneapolis, Minn., has been appointed superintendent of the Willmar division, with headquarters at Willmar, Minn., to succeed **J. E. Brawley,** who has been transferred to the Klamath division, with headquarters at Klamath Falls, Ore., to replace **A. E. Knights,** who has retired. **C. T. Kenney** has been appointed superintendent of terminals at Minneapolis, to succeed Mr. Welsh.

T. R. Beach, acting trainmaster on the Illinois Central, has been appointed trainmaster at Hattiesburg, Miss., to succeed **G. F. Dickson,** who is retiring.

E. Sullivan, district engineer of the Western district of the Missouri Pacific, with headquarters at Kansas City, Mo., has been appointed superintendent of the Southern Kansas and Central Divisions, with headquarters at Coffeyville, Kan., to succeed **P. Carroll,** who has retired.

George Hillier has been appointed acting transportation assistant of the British Columbia district of the Canadian Pacific, with headquarters at Vancouver, B. C., succeeding **W. E. Cline,** who has been given a leave of absence on account of illness.

J. A. Warren, road foreman of engines on the Indianapolis division of the Pennsylvania at Indianapolis, Ind., has been appointed acting trainmaster and road foreman of engines on the same division. **E. G. Rohrbaugh,** trainmaster on the Logansport division, with headquarters at Logansport, Ind., has been appointed acting division operator in addition to his duties as trainmaster, to succeed **C. C. Arrick,** who has retired.

F. T. Wilbur, superintendent of telegraph of the Illinois Central System, with headquarters at Chicago, has retired, effective January 1, after 39 years' service with this company, and the office of superintendent of telegraph has been discontinued, the duties of that office being assumed by the general superintendent of telegraph and signals. **G. K. Phillis,** chief clerk to the general superintendent telegraph and signals, has been appointed assistant superintendent telegraph, Northern lines, with headquarters at Chicago, and **D. C. Walker,** general foreman of telegraph, has been appointed assistant superintendent of telegraph, Southern lines, with headquarters at Memphis, Tenn.

Luis G. Morphy has been appointed general manager of the Rutland, at Rutland, Vt., as reported in the *Railway Age* of December 25, continuing also as chief engineer. Mr. Morphy was born at Orizaba, Vera Cruz, Mexico, on December 4, 1876, and attended Spring Hill College, Mobile, Ala., receiving his bachelor of science degree in 1897, and Rensselaer Polytechnic Institute, Troy, N. Y. He entered railway service in 1900 as transitman with the New York Central, serving successively as supervisor of track, assistant engineer, resident engineer and assistant to principal assistant engineer. In 1907 Mr. Morphy became assistant engineer maintenance of way and construction of the Boston & Albany, then serving as assistant to chief engineer, designing and division

Continued on third right-hand page

engineer and principal assistant engineer, consecutively. In 1920 he became manager in South America of the Foundation Company of New York. From 1921 to 1926, he served as chief engineer of the Rutland, becoming general superintendent and chief engineer in 1926, the positions he held at the time of his recent appointment. Mr. Morphy is a member of the Boston Society of Civil Engineers, the American Railway Engineering Association, the American Society of Military Engineers, the Vermont Society of Engineers and the American Association of Railroad Superintendents.

H. C. Munson, trainmaster on the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at La Crosse, Wis., has been promoted to assistant superintendent, with headquarters at Wausau, Wis., to succeed **B. F. Hoehn,** who is retiring at his own request after 42 years of continuous service with the Milwaukee. **J. D. Shea,** who has been on special work for the operating department, has been appointed trainmaster at Madison, Wis., to succeed **G. F. Hancer,** who has been transferred to Green Bay, Wis., to replace **E. G. Kiesele,** who has been transferred to Bensenville, Ill. Mr. Kiesele succeeds **J. M. Calligan,** who goes to Galewood, Ill., to replace **J. T. Hansen,** who has been transferred to La Crosse to succeed Mr. Munson.

TRAFFIC

Denis F. McCarthy, chief revision clerk on the New York, Ontario & Western, has been appointed assistant general freight agent, with headquarters at New York.

H. F. Rose has been appointed general eastern freight agent of the Grand Trunk, with headquarters at New York, succeeding **J. O. Adams,** who has retired after 50 years of service.

Marsh A. Oberg, chief clerk to the passenger traffic manager of the Chicago, Milwaukee, St. Paul & Pacific at Chicago, has been promoted to general agent, passenger department, with headquarters at Kansas City, Mo., to succeed **Ernest G. Woodward,** who is retiring at his own request on January 1, after 30 years of service with this company.

M. W. Simpson, traveling freight agent of the Canadian National, Grand Trunk and Central Vermont, with headquarters at New Haven, Conn., has been appointed general agent of the Central Vermont, with headquarters at Detroit, Mich., succeeding **A. C. White,** who has resigned to become assistant general freight agent of the Detroit & Toledo Shore Line.

L. E. Clarahan, general freight agent of the Wabash, with headquarters at St. Louis, Mo., has been promoted to assistant freight traffic manager with the same headquarters, to succeed **H. G. Holden,** whose death on December 5 at Cleveland, Ohio, was reported in the *Railway Age* of December 11. **F. G. Maxwell,** assistant general freight agent at St. Louis, has been promoted to general freight agent at that point to succeed Mr. Clarahan, and **P. A. Spiegelberg,** assistant to the general freight traffic manager at St. Louis, has been advanced to assistant general freight agent, to replace Mr. Maxwell. **G. W. Young,** chief clerk in the general traffic department, has been appointed assistant to the general freight traffic manager to succeed Mr. Spiegelberg.

ENGINEERING AND SIGNALING

George W. Varnum, assistant division engineer on the Atchison, Topeka & Santa Fe, with headquarters at San Francisco, Cal., has been promoted to office engineer in the office of the chief engineer of the Coast Lines, with headquarters at Los Angeles.

Major James V. Johnston, division engineer on the Mobile & Ohio at Jackson, Tenn., has been promoted to the newly-created position of principal assistant engineer, with headquarters at St. Louis, Mo. **V. C. Hanna,** assistant roadmaster at Murphysboro, Ill., has been promoted to assistant engineer at Jackson.

J. R. Nagel, division engineer of the Eastern division and the Kansas City terminals of the Missouri Pacific, with headquarters at Kansas City, Mo., has been promoted to district engineer of the Western district, with the same headquarters, to succeed **E. Sullivan,** whose appointment as superintendent is noted elsewhere in these columns. **P. P. Wagner** has been appointed division engineer of the St. Louis terminal and Illinois divisions and of the Missouri-Illinois Railroad east of the Mississippi river, with headquarters at St. Louis, Mo., to succeed **H. D. Knecht,** who has been transferred to the Eastern division and the Kansas City terminals, with headquarters at Kansas City, to succeed Mr. Nagel. These appointments become effective January 1.

Ellis Alexander Frink, engineer of bridges of the Seaboard Air Line, with headquarters at Norfolk, Va., who has been in charge of this road's bridges and steel structures since February, 1906, has retired from active duty with the company, effective January 1. Mr. Frink was born in Germantown, Pa., and obtained training and experience in the bridge engineering field with the Berlin Iron & Bridge Company, East Berlin, Conn., from 1887 to 1898. From 1898 to 1903 he was an officer and engineer of the structural Iron & Steel Company of Baltimore, Md. He then entered the contracting business in 1904 and for a short time was with the bridge department of the Baltimore & Ohio. In 1905 Mr. Frink became superintendent of erection of the Virginia Bridge & Iron Company of Roanoke, Va., now a subsidiary of the American Bridge Company. In February, 1906, he went with the Seaboard Air Line as engineer of bridges, at which time he took over the administration and direction of the bridge engineering department. He has been a member of the American Society of Civil Engineers since 1900, and of the American Railway Engineering Association since 1912, and served as a director for three years and as chairman of the Committee on Wooden Bridges and Trestles for five years with the latter association. He has for many years served as a member of the consulting bridge committee of the Railroad Presidents' Conference Committee on valuation.

MECHANICAL

P. P. Barthelemy, assistant master car builder of the Great Northern, has been promoted to master car builder, with headquarters as before at St. Paul, Minn., to succeed **C. H. Putnam,** who has retired.

A. J. Pichetto has been appointed general airbrake, steam heat and lubrication engineer of the Illinois Central, with headquarters at Chicago, to succeed **Emil Von Bergen,** whose appointment as assistant to the vice-president and general manager research is noted elsewhere in these columns.

R. Knorr, shop superintendent on the Erie at Susquehanna, Pa., has been appointed supervisor of car repairs of the Western district, with headquarters at Cleveland, Ohio, to succeed **C. Rhodes,** who has been transferred to the Eastern district with the same headquarters, to replace **W. H. Middaugh,** supervisor of car repairs at Port Jervis, N. Y., who has been transferred to other duties. **J. F. McMullen,** division car foreman at Buffalo, N. Y., has been promoted to shop superintendent at Susquehanna to succeed Mr. Knorr.

PURCHASES AND STORES

N. B. Coggins, division storekeeper on the Southern, with headquarters at Somerset, Ky., has been promoted to general storekeeper, with headquarters at Washington, D. C., to replace **J. W. Gerber,** who retired on December 31, after 42 years of service with this company.

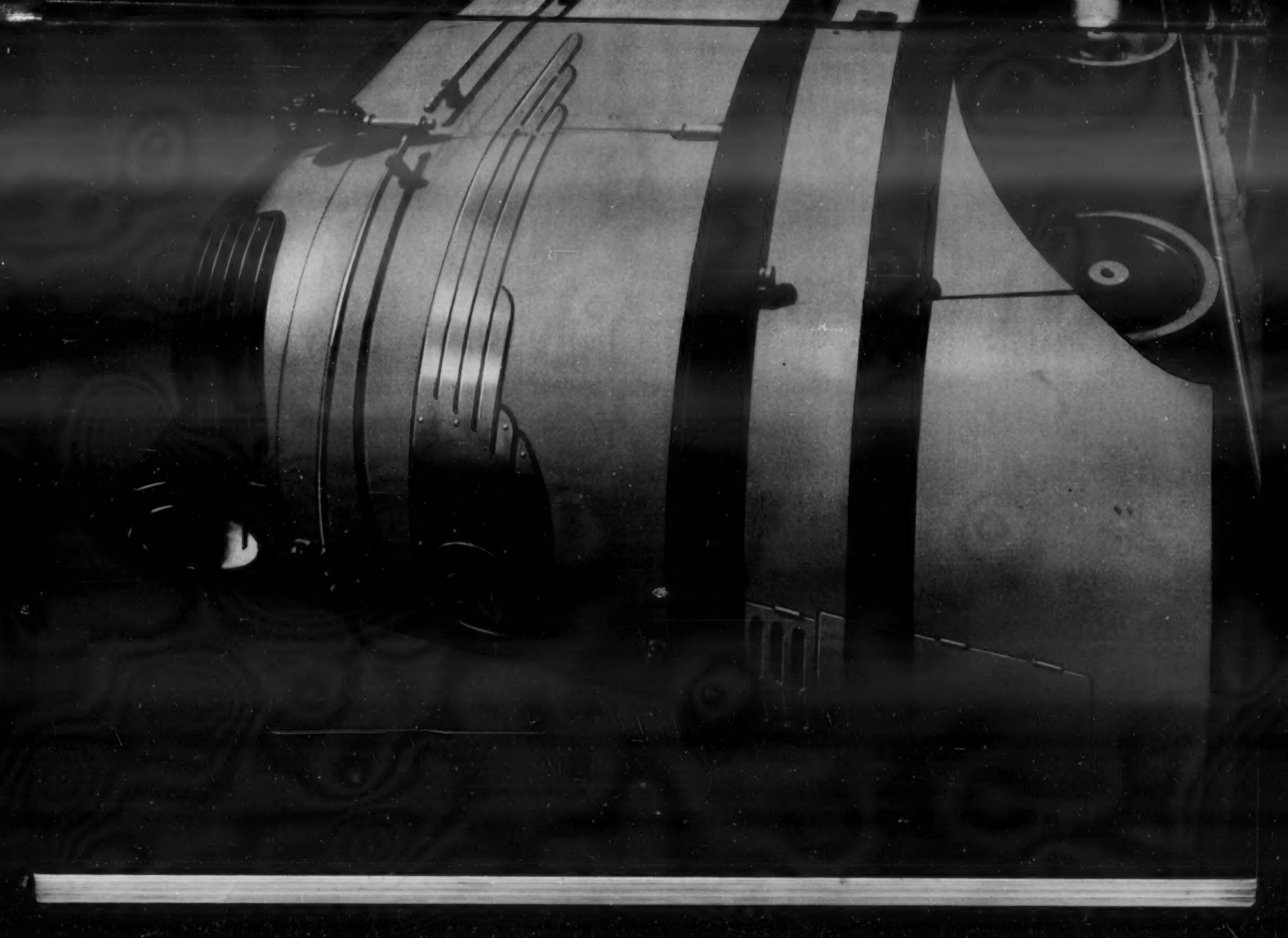
OBITUARY

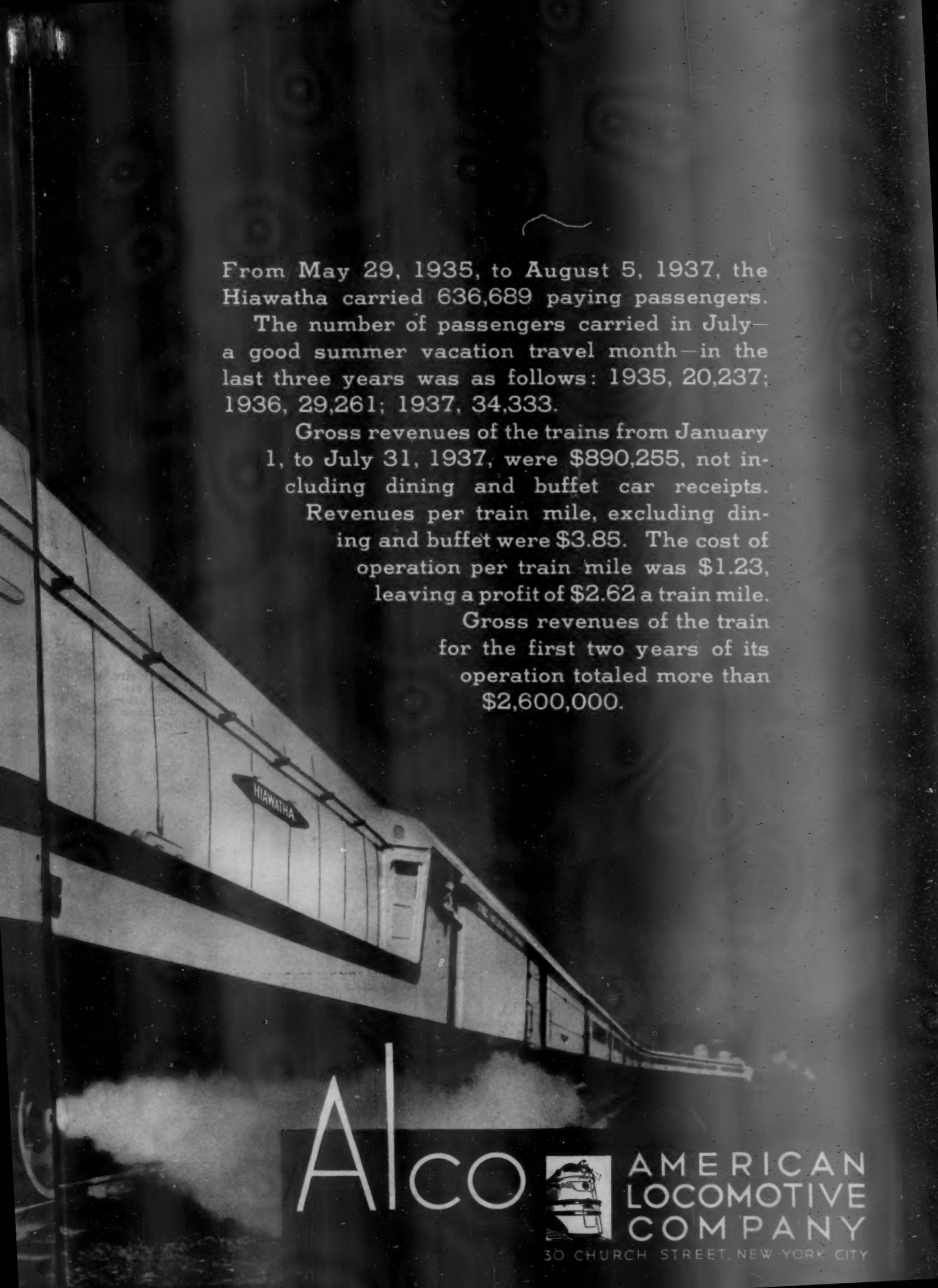
M. G. Crawford, assistant general superintendent transportation of the Northern Pacific, with headquarters at Seattle, Wash., died at Seattle on December 14.

Judson G. Fry, general Southwestern freight agent for the Baltimore & Ohio and the Alton at St. Louis, Mo., died suddenly of heart disease on December 25 at his home at St. Louis.

George H. Pegram, who was chief engineer of the Union Pacific system from 1893 to 1898, and who has been connected with the Interborough Rapid Transit Company since 1905, died on December 23 in the Brooklyn Hospital, Brooklyn, N. Y., at the age of 81.

Morris S. Blaiklock, retired assistant chief engineer of the Canadian National, who died at Montreal, Que., on November 25 at the age of 78, joined the Grand Trunk in 1880 as a draftsman. Rising through various engineering capacities, he became engineer maintenance of way in 1907, holding that position until 1923 when he was appointed assistant chief engineer, from which position he retired in 1931.





From May 29, 1935, to August 5, 1937, the Hiawatha carried 636,689 paying passengers.

The number of passengers carried in July—a good summer vacation travel month—in the last three years was as follows: 1935, 20,237; 1936, 29,261; 1937, 34,333.

Gross revenues of the trains from January 1, to July 31, 1937, were $890,255, not including dining and buffet car receipts. Revenues per train mile, excluding dining and buffet were $3.85. The cost of operation per train mile was $1.23, leaving a profit of $2.62 a train mile.

Gross revenues of the train for the first two years of its operation totaled more than $2,600,000.

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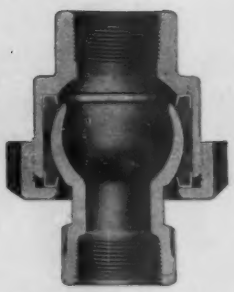
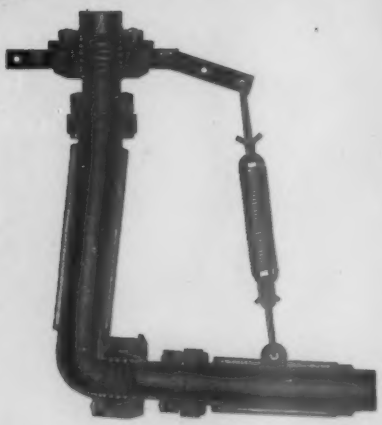
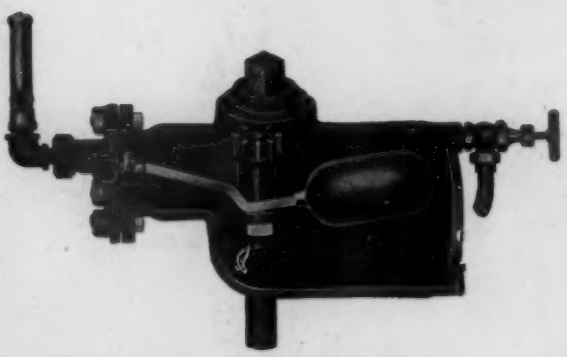


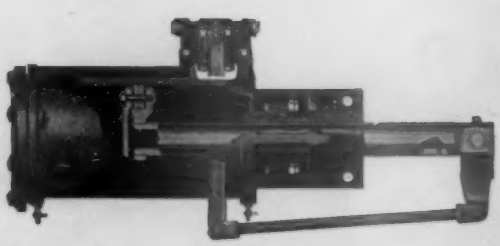
BARCO Flexible Joints between locomotive piping and auxiliary devices reduce pipe failures, delays and maintenance cost.



BARCO Metallic Steam Heat connections are one of the outstanding factors contributing to the efficiency, economy and comforts of passenger train heating.



BARCO Low Water Alarms which are widely known for their sureness of action, offer extra safety. Mechanically correct and simple. Low water never fails to blow the alarm whistle.



BARCO M-1 Balanced Power Reverse Gears provide for fine adjustment and accurate maintenance of point of cut-off with low cost due to BARCO Dual Control operating valve and outboard integral piston rod bearing. Locomotive efficiency is increased and fuel saved.

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